

In Severe Allergic Crises

PHENERGAN

R. P. 3277

Acts in a Striking Manner

2532

ACTIVITY—Phenergan is a new Paulenc antihistamine agent, with a very high experimental activity. Phenergan protects the guinea pig against the toxic effects of 1500 lethal doses of histamine for a period of from 7 to 9 hours.

PROPERTIES—Phenergan combines with its antihistamine activity both hypnotic and analgesic actions which augment further its therapeutic value.

INDICATIONS—The high potency of Phenergan makes it the drug of choice in those conditions which are resistant to ordinary antihistamine therapy or which are predominantly nocturnal, like asthma or nocturnal pruritus. The analgesic action can be successfully applied in the relief of such conditions as painful herpes zoster, cervicobrachial neuralgia, sciatica, etc.

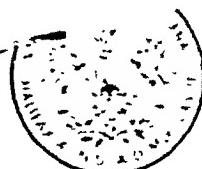
DESCRIPTION—Phenergan is a phenothiazine derivative; it is the hydrochloride of 2, dimethylamino, 1, methyl ethyl N, dibenzaparathiazine and is available in containers of 50, 500 and 1000 coated tablets of 25 mg. and in boxes of 10—2 c.c. ampoules of 50 mg.

REFERENCES—The value and properties of Phenergan have been reported by Halpern in the Journal of Allergy, 13: 263, 47 and by Pasteur-Vallery-Rodot; Hamburger and Halpern in La Presse Médicale, 58: 661, 47.

Clinical supply on request

POULENC

Interest in
Medicine,
Health work
and the
well-being of the



your prescription analgesic

CODOPHEN

C.T. No 260



Also supplied as
CODOPHEN STRONGER
CT No 260A
containing $\frac{1}{2}$ gr. Codeine

* Codophen tablets are orange colored
but are otherwise unmarked

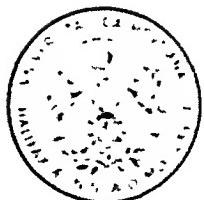
LEWORTH CHEMICAL CO., LTD. TORONTO, CANADA



Dean of the Faculty of Medicine • • • Dalhousie University, Halifax, N.S.

HARRY GOUDGE GRANT, M.D., C.M., M.R.C.S., L.R.C.P.

Dr. Harry Goudge Grant was born in Halifax on June 25, 1889. After preparatory schooling in that city, he entered Dalhousie University, graduating M.D., C.M., in 1912. Post-graduate work in London, England, led to M.R.C.S. and F.R.C.P. For a time, Dr. Grant practised medicine at Rose Bay, N.S., returning to England for further post-graduate study prior to settling in Halifax in 1920. A keen interest in Public Health, with which he keeps in touch as Professor of Preventive Medicine, took him to Virginia in 1925. There he remained in charge of County Health work until appointed to his present post in 1932. Dr. Grant is currently President of the Association of Canadian Medical Colleges.



DEANS OF MEDICINE OF CANADA . . . No. 4 of a series

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Report to
Canadian Physicians
from
Charles E. Froost & Co.



"TUTAMATE"

A complete nutritional supplement of particular value during pregnancy and lactation.

It can now be accepted beyond doubt that the health of the new-born baby is influenced to a large extent by the nutritional state of the mother during pregnancy and lactation.

An interesting summation of a number of studies on this subject has appeared in recent literature from which the following is quoted*:

"What may at first glance resemble a "fairy story" are the reports of the effect of the antepartum diet on the health of the offspring. Women who received a poor diet compared with those on an adequate diet had a greater number of stillbirths and prematurely born infants. The number of illnesses and deaths during the first few months after birth was much greater in infants born of mothers who had a poor antepartum diet than in the offspring of those who had received the recommended diet. These observations simply confirm what every one interested in animal husbandry has known for years; namely, that the health of the offspring is affected by the nutritional adequacy of the food eaten before the offspring is born."

"During the past thirty years pediatric care

has improved, with a striking reduction in the infant mortality rate. However, the reduction in the neonatal mortality rate has not been nearly so ample. For instance, in the city of Toronto the mortality rate for infants over 1 month of age and under 1 year of age dropped from 63 per thousand in 1915 to 9 per thousand in 1945, while the mortality rate for the first month of life dropped only from 46 per thousand in 1915 to 23 per thousand in 1945. Thus in 1945 no less than 72 percent of all deaths in the first year of life occurred during the first month of life . . .

"It can be demonstrated how easily and how frequently, even in the best fed areas of the country, pregnant women take diets low in the essential nutrients, particularly protein, calcium, iron and ascorbic acid."

**J. A. M. A., Vol. 134, May 10, 1947—Editorial*

From the Dept. of Maternal and Child Health, Harvard School of Public Health, Boston, Mass., Bertha S. Burke, in a publication, "Nutrition During Pregnancy", Conn. State Med. J. 1944, Sept. 1946, has tabulated** the optimal daily nutritional requirements in pregnancy and the optimal normal requirements of the average woman.

A factor not included in this table, but which has been shown to be of great importance, is iodine. Several recent publications have emphasized the importance of providing physiological amounts of iodine in the diet. This is best assured by providing in a regularly administered supplement small but measured amounts of this most important element.

It is thus apparent that consideration of nutrition in obstetrical practice is of first importance.

"Tutamate", a complete nutritional supplement specifically compounded to supply essential vitamins and minerals, will aid in the maintenance of a balanced diet during pregnancy and lactation, will contribute to the general health and well-being of the mother and give the baby a sound start in life.

Nutritional Essentials

	Normal	Pregnancy (4th through 9th month)	NRC Allowance Pregnancy
Calories	2,200-2,400	2,600-2,800	2,500
Protein, gm.	60	85-100	85
Calcium, gm.	0.8	1.5	1.5
Phosphorus, gm.	1.32	2.0	
Iron, mg.	15	20	15
Vitamin A, I.U.	5,000	8,000	6,000
Thiamine, mg.	1.5	2.0	1.8
Riboflavin, mg.	2.0	2.5	2.5
Niacin, mg.	15	18	18
Ascorbic acid, mg.	70	100	100
Vitamin D, I.U.		400-800	400-800



"TUTAMATE"

S.E.C. No. 653 *©C.W.*

<i>Principal ingredients</i>	<i>in daily dose</i>
Ferrous sulphate.....	3 gr.
Copper sulphate.....	2/25 gr.
For the prevention of nutritional anaemia.	
Vitamin A.....	5,000 I.U.
To aid in the building of resistance.	
Vitamin D.....	2,000 I.U.
Calcium phosphate.....	2 gr.
For the prevention of rickets, dentin caries and tetany of vitamin D deficiency.	
Sodium iodide.....	1/162 gr.
To protect against iodine deficiency.	
Thiamine hydrochloride (Vitamin B ₁)	2 mg.
Riboflavin (Vitamin B ₂)	3 mg.
For protection against and in the treatment of symptoms of vitamin B ₁ and B ₂ deficiency, including neuritis of B ₁ deficiency.	
Niacinamide	10 mg.
To aid in the prevention of pellagra.	
Ascorbic acid (Vitamin C).....	50 mg.
For the prevention of scurvy and for normal development of bones, cartilages, teeth and gums.	
Mixed tocopherols.....	12 mg.
To aid in the prevention of prematurity.	
†Pyridoxine HCl	1 mg.
†Calc. pantothenate.....	5 mg.
†The significance of these vitamins in human nutrition is not yet clearly established.	

Dose: Two capsules daily.

Modes of Issue: Boxes of 50, 100 and 250 capsules.

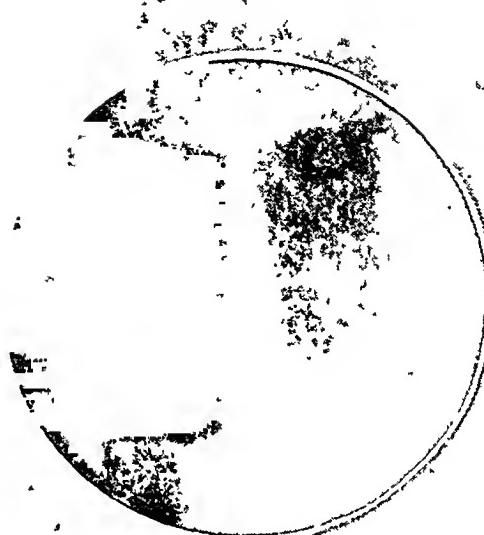
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MONTREAL CANADA

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Barium Sponge
Radiopaque Sponges
Three 30" Indicas. 10

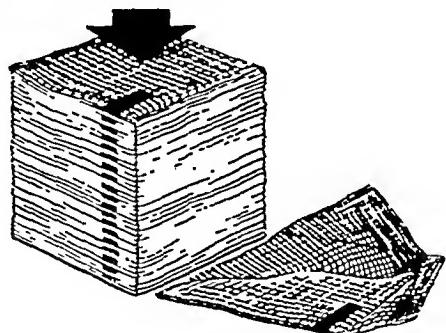


... Because They Alone Contain This Element

The shadow cast on an X-ray plate by the barium telltale of Curity Radiopaque Sponges and ABD packs is unique. Its shape and pattern make it quickly distinguishable from body structure or artefact; its radiopacity makes it easily and quickly identifiable—whether you use fixed or portable X-ray equipment, with or without a Bucky-Patter diaphragm.

The blackness of the barium telltale shows through covering folds of gauze (see sketch), and makes every Curity Radiopaque Sponge readily identifiable in the operating room without unfolding.

If you use Curity Radiopaque Sponges and ABD packs routinely in your operating room, it is easy to settle the problem of unaccounted-for sponges. For X-ray will determine whether a Radiopaque Sponge is in the patient or not. Give Curity Radiopaque Sponges a trial and see for yourself.



Every Curity Radiopaque sponge contains a rectangle of crinoline impregnated with barium. The barium element has these advantages:

- Can be seen clearly with portable or fixed X-ray equipment
- Is unmistakable, because of shape and pattern, for body structure or artefact
- Is visible in handling. Black color shows through gauze folds.

Only Curity Radiopaque Sponges give this unmistakable identification.

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Listed below are some of the most useful WILL preparations for the treatment of children . . . designed for use by the specialist and general practitioner.

- LINISYL

Respiratory conditions in infants and children.

Each fluid ounce contains:

Sodium Citrate	16 grs.
Sodium Bromide	8 grs.
Tincture Ipecac	12 mins.
Syrup Tolu	80 mins.
Syrup Wild Cherry	32 mins.
Mentholated Honey and Linseed	q.s.

- MAVITYL

Convalescent tonic.

Each fluid ounce contains:

Vitamin A	8000 I.U.
Vitamin D	4000 I.U.
Thiamine Hydrochloride	1.2 mg
Calcium, Sodium and Potassium Hypophosphites ..	10 grs.
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- CETOL COMPOUND No. 5

Analgesic, Antipyretic.

Compressed Tablet:

Cetol (Acid Acetylsalicylic) ..	1 gr.
Phenacetin	1/16 gr.
Caffeine Alkaloid	1/16 gr.

- CETOL COMPOUND No. 6

Analgesic, Antipyretic and Sedative

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Cetol (Acid Acetylsalicylic)	2 1/2 gr.
Dover's Powder	1/2 gr.
Aromatics	1/2 gr.

- CETOL COMPOUND No. 12

Analgesic, Sedative

Compressed Tablet:

Cetol (Acid Acetylsalicylic)	2 1/2 gr.
Phenyl (Pfer Barbitur)	1/2 gr.
Aromatics	1/2 gr.

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Bronchial and pulmonary affections
of infants and children

*Trade mark registered.



COMPLETE REMISSION

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* DRAWS PLASMA TO SURFACE . . . * DISSOLVES NECROTIC TISSUE

* BACTERICIDAL, DEODORANT, DETERGENT, PEPTIZING, NON-TOXIC

Glycerite of Hydrogen Peroxide
With Carbamide

* **BIBLIOGRAPHY**

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J A. Ph., A. (Sc Ed)
35 304, 1946.
Literature on request

Clinical studies concerned with the use of Glycerite of Hydrogen Peroxide in the treatment of chronic purulent otitis media demonstrated seventeen of twenty-nine patients in complete remission in 14 days and the remainder by the 38th day. The patients studied presented conditions existent for periods of 2 weeks to over 40 years. Previous treatment by the usual therapeutic means, including tyrothricin or penicillin, was ineffective in all cases.

Constituents:

Hydrogen Peroxide 1.446%, Urea (Carbamide) 2.554%, 8 Hydroxyquinoline 0.1%.
Dissolved and stabilized in substantially anhydrous glycerol . . . q.s. ad. 30cc.

Available on prescription in one-ounce bottle with dropper.
Administration: One half dropperful two to four times daily.

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IN PREVENTIVE IMMUNOLOGY!

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LEDERLE now makes available to physicians, in several forms, new PUROGENATED TOXOIDS for the prevention of diphtheria, tetanus, and simultaneous immunization against tetanus and diphtheria. These toxoids have the following advantages—

1. From these toxoids 99.7% of the nitrogenous impurities have been removed, the non-toxoid nitrogen having been reduced to approximately 0.15%.
2. In the alum-precipitated forms the alum content has been reduced by 75%, thus reducing to a minimum any local reactions caused by that substance.
3. These toxoids appear to be essentially free from substances which cause reactions in children and adults.
4. The antigenic property of the new toxoids is so highly concentrated that the dosage required is only one-half the volume usually required with standard toxoids.
5. A very high, durable, and active immunity is produced.
6. A single "booster" dose at about 6 years of age in the case of diphtheria, or at the time of exposure in the case of tetanus, will provide a rapidly increasing immunity, with a very rapid increase in blood titers to high levels.
7. Immunization may be done at about the sixth to ninth month of life without, as a rule, any preliminary "reactor test," and with a minimum of reactions.
8. The fluid preparations are completely colorless and the alum-precipitated forms exhibit only a slight opalescence.

PUROGENATED DIPHTHERIA TOXOID Refined Alum Precipitated
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1 immunization — one vial containing 1.0 cc
1 immunization — one vial containing 0.5 cc

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1 immunization — one vial containing 1.0 cc
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Libby's exclusive Homogenization process brings about physical changes in the structure of strained foods which forestall the danger of gastro-intestinal disturbances. Homogenization ruptures cell capsules and comminutes inert cellulose fibres thus facilitating their handling in the infant's digestive tract. Clinical tests demonstrate that Libby's Homogenized Baby Foods are well tolerated as early as the sixth week. They cause no increase in the frequency of stools and no gastro-intestinal disturbance is evidenced. As Homogenized foods supply the anti-anemic factors necessary to arrest the development of nutritional anemia, they possess assets of great practical value which are possessed by no other baby food.

Libby's strained and homogenized Baby Foods offer important nutritive values. A chart showing the nutritional analysis of these foods is available. For copies, pediatricians and physicians are invited to write to Libby's, Chatham, Ontario.

LIBBY'S PROCESS of HOMOGENIZATION

OPENS cell capsules, releases contained nutriment, and disposes it homogeneously throughout.

COMMINUTES indigestible cell membranes and coarse cellulose fibres.

EXPOSES the nutriment to the digestive juices in a considerably increased surface area, thus facilitating digestion.

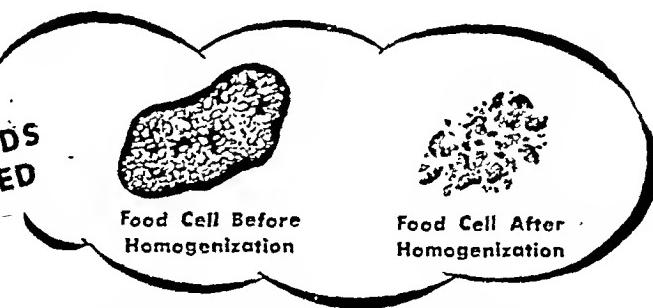
INCREASES availability of the contained nutrients, thus facilitating utilization.

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The administration of "Premarin" at the menopause has been found to alleviate not only the physical symptoms but the mental depression as well. After treating 61 menopausal patients with "Premarin", Neustaedter* stated, ". . . appetite increased, sleep improved, attacks of perspiration disappeared, and there was definite improvement insofar as other complaints were concerned. All patients described a sense of well-being."

*Neustaedter, T. Am. J. Obst. & Gynec. 45:535 (Oct.) 1943.

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conjugated estrogenic substances (6 parts)

TABLETS: ✓ 50 mg. 125 mg. per tablet

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LIQUID: ✓ 50 mg. 100 mg. per 5 ml. bottle

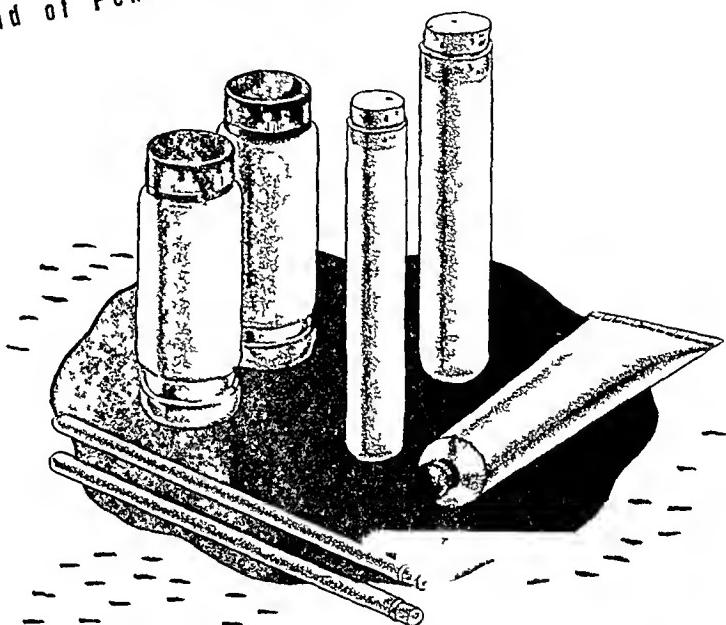
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PENICILLIN THERAPY

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Ayerst Brand of Penicillin



When infection due to penicillin sensitive organisms occurs in the ambulatory or non-hospitalized patient, penicillin injections are often not only impracticable but unnecessary. Systemic infections are readily treated in adults with "Cillenta" Tablets; in children, with "Cillenta" Tablets for Pediatric Use. Mouth and throat infections respond to "Cillenta" Throat Lozenges; skin infections to "Cillenta" Ointment. Penicillin solutions are readily and easily prepared from the Soluble Tablets.



Ayerst Penicillin for Injection is available in various forms and potencies for immediate use when this type of therapy is desirable.

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Reports on the use of 'Physeptone' brand Methadon indicate that an outstanding advance has been made in the management of severe pain. With few exceptions it may, with advantage, replace morphine, to which it is equal or superior in analgesic effect.

'Physeptone' does not unduly depress respiration, constipate or induce narcosis or mental apathy; it may be given continuously for long periods without diminution of effect.

'Physeptone' is a recently developed synthetic compound, chemically unrelated to the opium alkaloids.

Federation Proc. (1947), 6, 327.

Hewer, A.J.M. and Keele, C.A. (1947) Lancet, ii, 221.

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Bottles of 25 and 100 products.

'PHYSEPTONE' Brand Injection of Methadon.

Ampoules of 10 mgm. in 1 c.c.

Boxes of 12.

'Physeptone' is sold subject to the Regulations of the Opium Control Act.



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Clinical Experience has indicated that, as an adjunct to conventional therapy, Streptomycin is the most effective chemotherapeutic agent in the treatment of certain cases of tuberculosis. In selected cases, Streptomycin has been found effective in shortening the period of disability. The new, improved form of this

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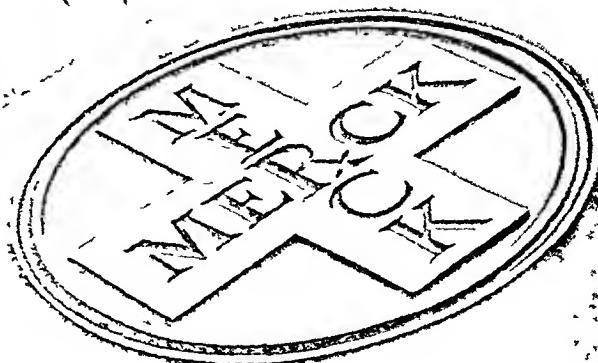
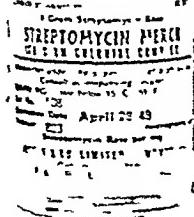
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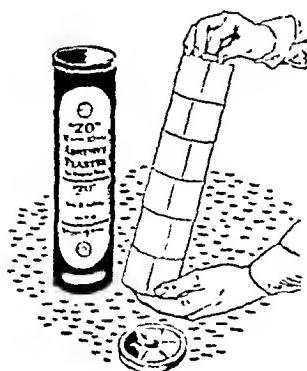
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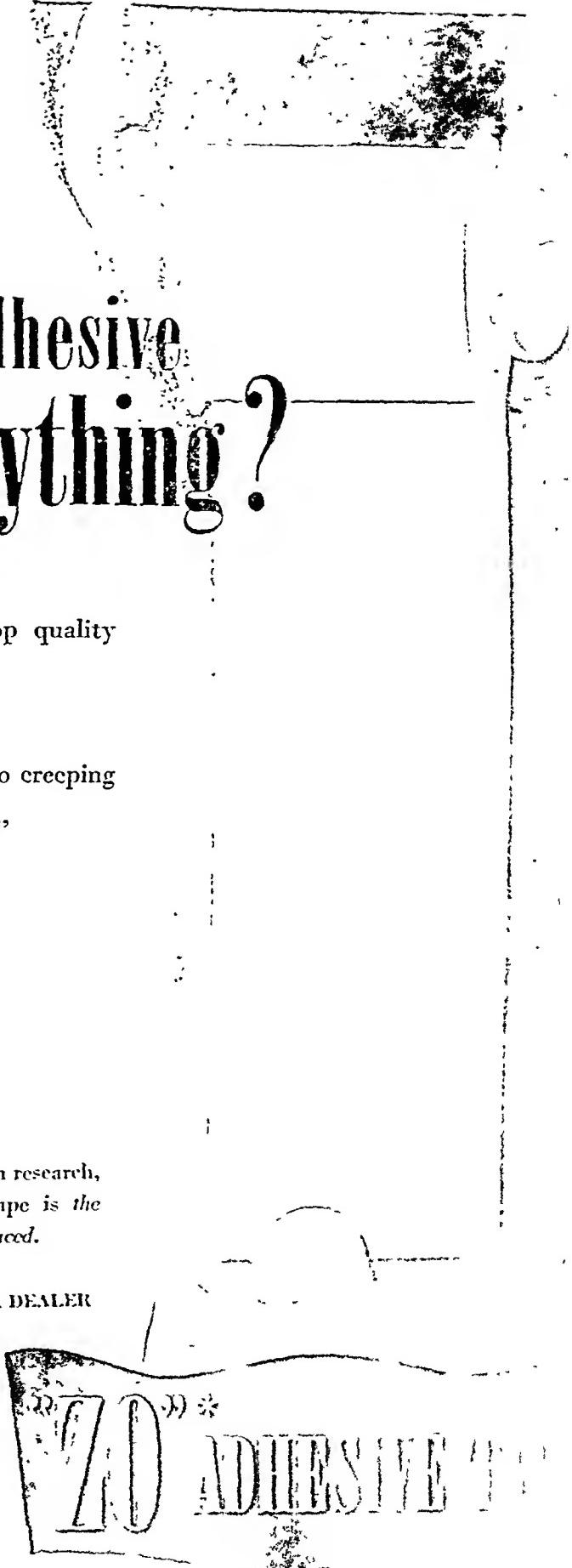


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LOSS OF SOFT TISSUE OF CHIN AND OF MANDIBLE

Gypsona as an adjuvant in
reparative surgery

Fig. 1



Fig. 2

CASE-HISTORY—The patient was injured in July, 1941, when his ship was bombed and machine gunned. Examination showed the lower lip divided and a loss of soft tissue of chin and of mandible from right molar region to left incisors. On August 29th, 1941, two tube pedicles were raised on the neck. These were lengthened four weeks later. On October 22nd the scars were excised from the face and the two pedicles attached.

- November 11th, 1941 — The pedicles divided.
- February 24th, 1942 — A bone graft was inserted.
- June 26th, 1942 — An aero-mio thoracic tube pedicle was raised.
- July 22nd, 1942 — The pedicle lengthened.
- July 31st, 1942 — The pedicle attached one end.
- September 24th, 1942 — The pedicle attached the other end.
- February 2nd, 1943 — A further bone graft was inserted with Gypsona P.O.P. headap and plaster between each pair of pins.
- October 20th, 1943 — Chin dimple made.

The details and illustrations are of an actual case. T. J. Smith & Nephew Ltd., of Hull, England, are privileged to publish this instance typical of many in which their products have been used with success.

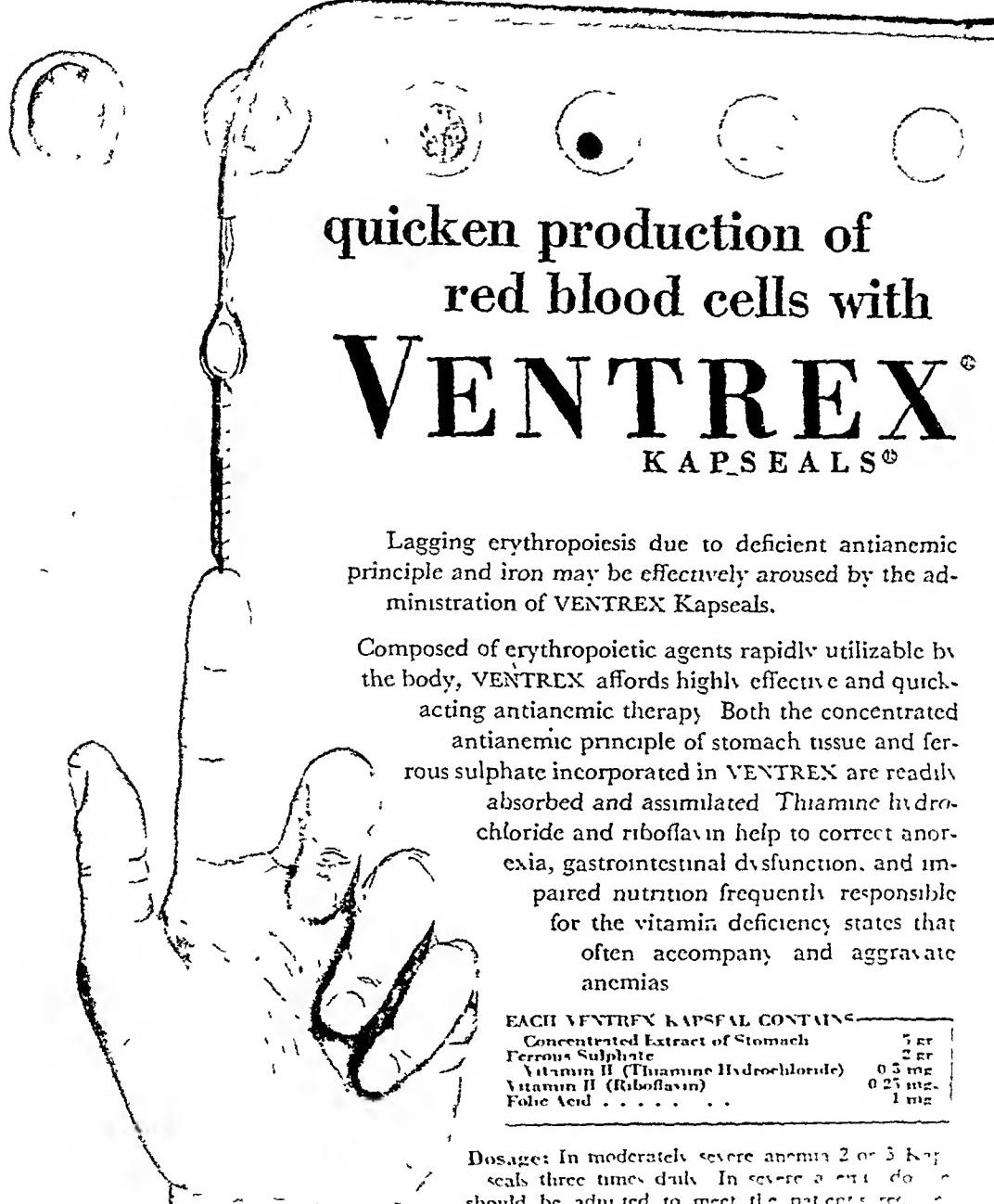
Fig. 3

Gypsona Plaster of Paris bandages are quick-setting and are ready for immediate use. They are supplied in 2", 3", 4", 6", 8" x 3 yds. Gypsona is also available in ready cut slabs.

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red blood cells with

VENTREX®

KAPSEALS®

Lagging erythropoiesis due to deficient antianemic principle and iron may be effectively aroused by the administration of VENTREX Kapsals.

Composed of erythropoietic agents rapidly utilizable by the body, VENTREX affords highly effective and quick-acting antianemic therapy. Both the concentrated antianemic principle of stomach tissue and ferrous sulphate incorporated in VENTREX are readily absorbed and assimilated. Thiamine hydrochloride and riboflavin help to correct anorexia, gastrointestinal dysfunction, and impaired nutrition frequently responsible for the vitamin deficiency states that often accompany and aggravate anemias.

EACH VENTREX KAPSEAL CONTAINS

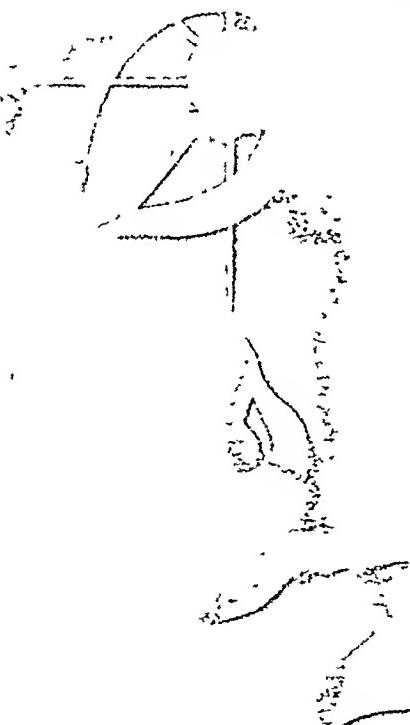
Concentrated Extract of Stomach	5 gr
Ferrous Sulphate	2 gr
Vitamin H (Thiamine Hydrochloride)	0.5 mg
Vitamin H (Riboflavin)	0.25 mg
Folic Acid	1 mg

Dosage: In moderately severe anemia 2 or 3 Kapsals three times daily. In severe anemia do not exceed 4 Kapsals daily. In chronic cases, 6 to 8 Kapsals daily are usually sufficient for maintenance.

Bottles of 100, 500 and 1000

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restful sleep . . . fresh awakening!

The hypnotic and sedative of choice
in insomnia and moderate cases of
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As a hypnotic, Persedon 'Roche'
rapidly induces sleep—
it is well tolerated, active, and
in long-continued administration
its beneficial effects are not attended
by unpleasant after-effects.

In cases of disturbed sleep and
wakefulness, Persedon 'Roche' can
be used, for its action is prompt
and relatively short, allowing the
patient to awaken shortly after
fresh and active.

As a light sedative, Persedon 'Roche'
can be used during the day without
causing dullness or sleepiness.

dosage:

To induce sleep: 1 to 2 tablets
15-20 minutes before bed-time.

Break sleep during the night: half of one tablet.

Sedative: $\frac{1}{2}$ tablet 1-3 times a day.

Children under 12 years of age are given reduced doses.

In all cases tablets should be swallowed with water.

packings:

Bases of 10 and bottles of 100 tablets.

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MONTREAL



There'll be **LESS WEEPING**

This season



MORE ALLERGIC PERSONS THAN EVER BEFORE CAN

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The rise of scientific surgery in Canada began in the last ten years of the last century. John Stewart of Halifax, the first of the Lister Lecturers in this Association had been Lister's house-surgeon at the time he transferred from Edinburgh to London. Grasett and Baldwin of Toronto also served as his house-surgeons. A little later young Canadian graduates began to drift to London and Edinburgh to attend clinics and to try the qualifying examinations. They ultimately returned to Canada and began the slow process of segregating off from general medicine in the teaching hospitals the departments of general surgery. Here in Toronto the leaders in this movement were Aikens, Cameron, Grasett, Peters and Primrose. I think Geo. Peters was the first Canadian to come back with the diploma of Fellowship in the Royal College of Surgeons of England. In Montreal the outstanding men were Bell, Shepherd and Armstrong, and throughout the rest of Canada there was a sprinkling.

When one compares the training that these men received with that of the young men now preparing for surgical careers, it seems to have been totally inadequate. One must remember, however, that at the turn of the century the practice of surgery was largely concerned with the treatment of fractures and other traumas, and of acute infections, and that the fields of abdominal and thoracic surgery and of orthopaedic surgery, neurosurgery and vascular surgery were practically unknown. A prolonged training, therefore, was unnecessary and indeed was impossible to obtain.

As the 20th century advanced two great changes occurred. First, a tremendous forward movement began in medical education, beginning in Germany and then moving into America. The opening of the Johns Hopkins Hospital and Medical School with the introduction of the full time professorships and the resident system marked the beginning of a movement which has gradually spread over the English-speaking world. The Rockefeller Report on Medical Education swept into the discard all the substandard schools, and the Foundation, both by advice and by financial assistance, which with the greatest of liberality was extended to Canada, led the schools of this continent to the position of leadership they now occupy. In this general advance surgery had its share.

The second great change occurred in the hospitals. Not only in the educational centres but in every city and town in the country hospitals began to be built and each was provided with much improved surgical equipment. It soon became possible to carry out all sorts of advanced surgical procedures at a distance from the medical centres associated with the schools. The combination, therefore, of the rapid increase in the number of medical conditions amenable to surgery and of the tremendous increase in hospital accommodation and equipment made the training of the surgeon and the surgical specialist one of the most urgent problems in medical education.

The first move in Canada was made in 1921 when Clarence L. Starr accepted the appointment of Professor of Surgery in Toronto on a full-time basis and made the beginnings of the Resident System in the General Hospital. Since then we have gradually built up a system involving the Toronto General, St. Michael's, the Toronto Western, and the Hospital for Sick Children, and more recently the hospitals of the Department of Veterans' Affairs, and the Weston Sanatorium, in which after the ordinary rotating internship the students are enrolled as candidates for the degree of Master of Surgery for periods varying from three to five years. In this course the candidates, acting as senior interns or what our American friends call assistant residents, receive a practical training which includes an extra six months of medicine, six months of pathology, a year of general surgery, and a year or more of the surgical specialties. For those candidates who seem to have an aptitude for academic life it includes also a year in one of the research laboratories, a year abroad, and a year as resident surgeon.

On the surface it might appear that the inauguration of such a program would be simple. I did not find it so, however, for it involved a complete change of attitude of the staff towards education. In the past it was the duty of the surgeons to do the surgery and to teach the simple fundamentals to the undergraduates. It was no part of their duty to train surgeons and few of them ever did. The interns, of whom there were only 12 in the General Hospital in my day, came for a year or so on rotating service and then drifted into practice. To change this it was necessary that

a certain group of founders were selected from the staffs of the medical schools and the larger non-teaching hospitals and from those practitioners who had demonstrated proficiency in surgery and were actually doing the work. It has been said with some bitterness that many of us who were founders could not possibly pass the examinations now being set for the candidates for fellowship or certification. This is probably quite true but, on the other hand, we had the practice and there was nobody else to take care of it, at any rate until better men could be trained. The indications are clear however, that with the establishment of the high standards of apprenticeship and of academic studies now required by the Colleges and Boards, and with the certainty that sooner or later license to practice surgery will be granted only to those with these high qualifications, all our schools must be brought into action now if we are to turn out an adequate supply of trained men.

Great changes have taken place in the lives and the practices of surgeons and the surgical specialists since I was young. In those days most of the surgeons of Toronto were general practitioners and it was not until after the first war that the staffs of our hospitals were required to limit their work to their specialty. It was obvious then, however, that the field of surgery already widened and that much greater demands were imminent, that it was accepted as a void over that he who would espouse a wife for better or for worse must forsake all others and cleave unto her until death did them part. The amount of reading, travelling and studying that a modern surgeon must do to keep abreast of his constantly changing science is so great that it is quite impossible for him to give his mind to anything else.

Soon after the products of our attempt at mass production of surgeons began to come off the assembly line this problem of limitation of practice came up. I knew perfectly well that these young men could not keep abreast of modern surgery if they were cluttered up with other kinds of practice but my friends all over the country assured me that if a young man tried to limit himself to surgery only he would starve to death; that all the doctors in the towns did their own less difficult surgery and that if anything unusual came up they sent it to a consultant in the city rather than to a local prac-

titioner. Well, the first dozen or so were either absorbed by Toronto hospitals or joined established clinics. They all limited their practice to surgery only and they all did well. Then one went to a large town, informed the doctors of his training and qualifications, and made it known that he would limit his practice to surgery and would not be in competition with them in other types of work. Promptly he began to get referred work. First it was fractures, appendices, and varicose veins, then a gall bladder, then a fracture of the neck of the femur, then a couple of goitres, then a carcinoma of the stomach, and the last time I saw him he had successfully dealt with a sciatica by removing a disc. By the time he got the gastrectomy to do he was so out of practice in stomach work that he came back to Toronto and got Dr. Roscoe Graham to do one with him. These young men know that their Alma Mater is behind them and that when they need help they can get it.

So we were committed to the principle that after four or five years of postgraduate work, and after getting the diploma of Fellowship in one of the Royal Colleges and perhaps the M.S., which is an additional guarantee, we shall limit ourselves entirely to surgery. We feel that this plan will not only provide our country with the best service but that it will be acceptable to those practitioners who are not surgeons.

The success of such a plan as I have outlined must, of course, depend very largely on the approval and support of the profession at large. There is little room for doubt, however, that if qualifying standards are kept high and if the supply of properly trained men is sufficient the practitioners all over the country will welcome them (as, indeed, they have already done) and place in their hands those patients for the treatment of which they have been so specially trained.

In this relationship I must speak briefly of the pernicious practice of splitting fees. Some of these young men have told me that in some of the cities and towns where they have considered settling, fee-splitting is so universal that they did not think there would be a chance of getting a practice without it. My answer has invariably been that if they haven't the small amount of moral courage necessary to resist that sort of thing, they certainly have not the

During the summer of 1946, he began to notice swelling and protrusion of the left eye, which would take place after driving or after seeing a movie. He complained of double vision on looking upwards, or upwards and outwards. This condition became progressively worse and during January, 1947, the left eye became permanently and progressively protruded.

On admission to the Montreal General Hospital on February 10, 1947, there was a palpable swelling in the upper outer corner of the left orbit which visibly displaced the eye downward (see Fig. 6); there was marked proptosis (exophthalmometer readings; right eye = 17.0 mm.; left eye = 23½ mm.) with almost absent upward rotation of the left eye. There was venous engorgement in the left fundus, but the fields of vision were essentially normal. No pulsation or bruit was heard over the orbital area; vision right = 6/9, left = 6/12. Apart from this, personal and family history, general physical examination, and laboratory tests including blood and cerebro-spinal fluid serology were essentially negative. Detailed x-rays, including a pneumogram, showed a concentric, expanding lesion with rarefaction of the left frontal bone. It extended from the frontal sinus on its

moved leaving the dura mater under the left frontal pole exposed to the orbital fat. The dead space was filled with fibrin foam and the wound closed (see Fig. 9).

The postoperative course was uneventful, and on March 8, he was discharged. At this time he noticed improvement in his diplopia. On April 14, he was readmitted for tantalum cranioplasty of the left fronto-orbital defect. Since then, he has had no subjective symptoms, and the mild ptosis following the first operation has disappeared.

Ophthalmological examination August 5, 1947: No diplopia. Esophoria 8Δ. Right hyperphoria 4Δ. Vision, right = 6/6; with correction = 6/6; left = 6/6; with correction = 6/6. No exophthalmos; complete comfort. He has returned to his job and to his usual normal activity.

Pathological report.—Specimens obtained at time of operation February 27. One group of sections consists of irregular masses of disintegrating blood clot, the majority of the red cells of which are laked. Throughout this clot, there are large numbers of elliptical crystal clefts together with numerous yellow-brown crystals, rhombic in shape, and a smaller number of fine, brown, pigment granules. Relatively few leucocytes are entangled in the clot, together with a few larger, rounded cells with small, central, pyknotic nuclei, and eosinophilic, sometimes vacuolated cytoplasm. These resemble macrophages. Some such cells contain finely-granular, brown pigment within the cytoplasm. Included with the clot is a minute fragment of disintegrating, dead bone and an attached mass of dense fibrous tissue. There are several fragments of dense fibrous connective tissue in which there are elliptical crystal clefts, surrounded by a granulomatous reaction. This consists of fibroblasts, lymphocytes, and eosinophilic macrophages; some of the latter contain fine, granular, greenish-brown pigment. Similar pigment is seen in clusters of macrophages throughout the fibrous tissue, together with a light scattering of lymphocytes and an occasional polymorphonuclear (see Figs. 12 and 13). In unstained frozen sections, bright red crystalline material was seen. This is not evident in the paraffin section. These are probably some form of iron.



Fig. 6. (Case 2).—Preoperatively. Figs. 7 and 8. (Case 2).—X-ray views of lesion. Fig. 9. (Case 2).—Postoperatively.

medial aspect, along the outer, superior orbital margin to the zygomatico-frontal suture, and backwards in the temporal bone involving the greater wing of the sphenoid (see Figs. 7 and 8). An electroencephalogram showed some slow wave activity in the left anterolateral frontal region. Several pathological diagnoses were considered, among them cholesteatoma, Schüller-Christian's disease,⁴ mucocele, haemangioma of the left frontal sinus,⁵ or some other neoplasm (see above table from Dandy).

On February 27, a craniotomy was performed, by Dr. Harold Elliott, through a transverse incision along the superior margin of the orbit. The surface of the frontal bone, from the supraorbital notch laterally into the temporal fossa, was bluish in colour and "eggshell" in thickness. The tumour had eroded through the bone into the temporal fossa, and brownish, amorphous-looking material escaped on breaking through the eggshell-like outer plate. The immediate frozen-section report was: "foreign-body reaction to a crystalline substance and blood pigments without evidence of neoplasm". All the affected bone (the floor of the anterior fossa, the superior orbital plate, the orbital margin including the fronto-zygomatic process, and part of the temporal bone) was removed. The upper orbital fascia was also re-

A second group of sections consists of a mass of moderately cellular and fibrous connective tissue, throughout which there are innumerable, elliptical clefts with pointed ends. Many of these spaces are lined and surrounded by enormous numbers of foreign-body-multinucleated giant cells. In some areas there are foci of swollen macrophages many of which contain finely granular greenish-brown pigment which is also abundantly scattered throughout the

tissue. In addition there is an abundance of yellowish-brown round and oval pigment granules.

A third group of sections consists of an elongated strip of moderately cellular, and in part hyaline, connective tissue, in which there is a light scattering of lymphocytes, polymorphonuclears, and macrophages, with, at a few points, elliptical clefts bordered by foreign-body giant cells. Pigment, as described above, is also present. Along one margin and enclosed within the fibrous tissue are several narrow strips of bone which are atrophic and disintegrating. Along the surfaces there is blood clot. In frozen sections stained by Scharlach-R, abundant lipid droplets are present within large numbers of

globin origin. In view of the abundance of haemogenous pigment, and the type of reaction, we are inclined to view this as a traumatic lesion, following the formation of a haematoma at some remote period.

Pathological diagnosis: post-traumatic chronic granuloma in bone.

CASE 3

This third case is presented because it shows an identical type of lesion in a rib. Although it might appear to spoil the continuity of the presentation, it is included since it adds to the understanding of this type of tissue reaction.

A white 53-year old male suffered multiple injuries in an automobile accident in 1916. He injured the left side of the chest but he was told that "no bones were broken". In 1918 he suffered war wounds involving the head, legs, and left elbow, but does not recall rib injuries at that time. On May 3, 1939, he fell down three flights of stairs and was admitted the same day to the Montreal General Hospital with pain in the left side of the chest suggesting a rib fracture. X-ray films showed a fracture line through an area of "cystic change" in the left tenth rib, and the possibility of a metastatic tumour was suggested. On May 20, an excision of part of the left tenth rib, from the midaxillary line to a point 2" from its neck, was carried out. An expanded portion of rib near its angle was found, and the periosteum was especially adherent in this region. This included the "cyst" as well as the recent fracture.

His personal history, family history, general physical examination, and laboratory tests including the blood Wassermann were non contributory.

His subsequent clinical course was uneventful.

Pathological report.—A longitudinal section consists of 3½ cm. of rib. At one end, the diameter is that of a normal rib; the cortex on either side is intact and of normal thickness; the whole of the marrow cavity with the exception of a little bit of subcortical, trabeculated bone on one side is replaced by a granulomatous tissue. This consists of cellular fibrous tissue in which are incorporated many fat cells and some small cysts. Throughout, there is considerable lymphocytic infiltration and some minute fragments of preformed bone. Beneath the cortex of one side there is a broad band composed of large foam cells with small nuclei. The whole granulomatous area is permeated with thin-walled blood vessels. About the centre of the marrow space is a small focus of new bone formation (see Figs. 14 to 17).

As the section is traced along, the cortex becomes thin and the rib expanded. At one point the cortex is fractured and one fragment is depressed into the underlying granulation tissue. The central part of this area is composed of masses of homogeneous, eosinophilic, coagulum, in which may be seen many poorly-preserved, red blood cells and many elliptical slits repre-

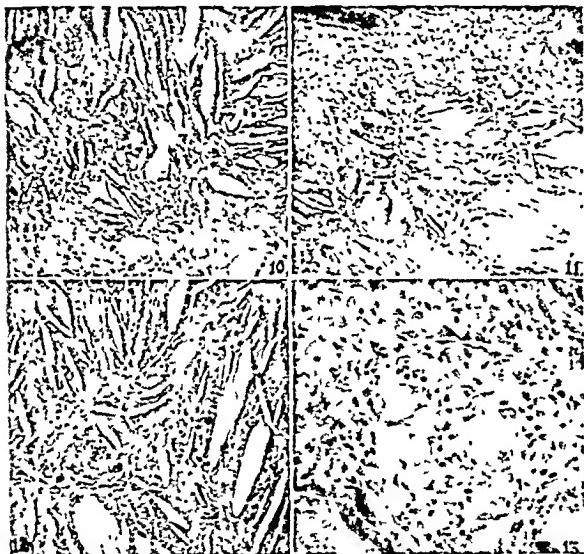


Fig. 10. (Case 1).—Shows the mass of granulation tissue with many clear elliptical slits about which there are foreign body multinucleated giant cells. At the lower margin of the section is a fragment of bone embedded in fibrous tissue. Fig. 11. (Case 1).—Shows chronic granulation tissue with innumerable elliptical slits and foreign body giant cells. Along the upper margin of the section is a considerable area of foam cells. Fig. 12. (Case 2).—Shows well organized fibrous tissue in which are many elliptical clear slits and a few multinucleated giant cells. Fig. 13. (Case 2).—Shows chronic granulomatous tissue with many foam cells.

macrophages. In addition some of the rhombic crystals retain the Scharlach-R.

There is no histological evidence of malignancy in these sections, nor of neoplasia for that matter. The lesion is a granulomatous one, with marked foreign-body giant cell reaction, fibrosis, and minimal inflammatory cellular exudate about lipid crystals. Pigments of several types are also present; these are probably of haemo-

senting dissolved-out crystals. Surrounding these areas there is fibrosing granulation tissue showing variable infiltration by lymphocytes and plasma cells, great numbers of foam cells, and many elliptical crystal slits, about which foreign-body giant cells are numerous. At several points there is new bone formation and some areas of recent haemorrhage. In places the cortex shows lacunar absorption with widening of the Haversian canals filled with a loose vascular connective tissue. The overlying periosteum, where intact, is thickened and is quite cellular in its deeper part.

Pathological diagnosis: post-traumatic chronic granuloma in rib.

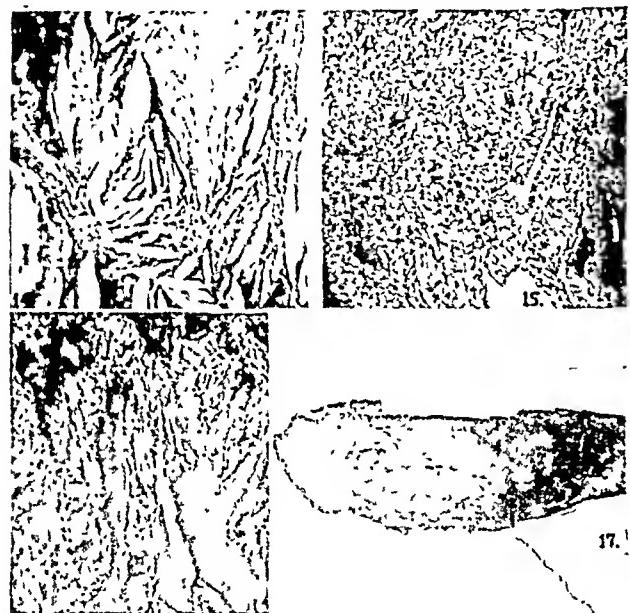


Fig. 14. (Case 3).—Shows chronic granulomatous tissue about elliptical slits, and in which there is fibrous tissue formation. Fig. 15. (Case 3).—Chronic (Case 3).—New bone formation at the margin of the granuloma. Fig. 17. (Case 3).—Longitudinal section of rib showing the expanding granuloma.

DISCUSSION

Radiologically, this condition can simulate any osteolytic lesion involving the frontal bone adjacent to the frontal sinus. Such possibilities are solitary myeloma, metastatic carcinoma, primary osteogenic tumours, mucocoele from the frontal sinus, other chronic granulomas, and traumatic bone rarefactions.^{1, 2}

The primary osteogenic tumours are rare in this age period and also infrequent in the skull. If we exclude these and the other above malignant conditions, we must consider the possibility of a mucocoele of the frontal sinus. This may be mistaken for a new growth or a chronic granu-

loma. It may grow and encroach upon the orbit. X-ray films show an area of decreased density surrounded by a zone of reactive bone with a history of slow growth. The sinus may show evidence of thickened mucous membrane. Any such defect in the bone may be due to a monostotic fibrous dysplasia of bone. The granulomas such as lipoid granuloma or eosinophilic granuloma are to be suspected. Syphilis, the great imitator, is always to be considered.

An osteolytic lesion of this type does not present features that permit of an exact etiological diagnosis.

Pathologically, the study of the two cases of tumour of the bony orbit shows identical features. The essential lesion is a chronic granuloma composed of granulation tissue about multiple elliptical crystal clefs and cholesterol crystals. The granulation tissue contains multinucleated giant cells and many fat-laden phagocytes and a variable degree of fibrosis. Different kinds of blood pigment can be identified in both lesions. The third case herein reported represents an identical type of lesion in a rib of a man who gave a history of multiple injuries similar to the two orbital cases. This identical reaction in the three cases is interpreted as a post-traumatic chronic granuloma due to degeneration of blood and fat. Associated bony fracture may be concerned in the mechanism of production. It is characteristic of these granulomas that the process is progressive over a long period of time and causes expansion and absorption of the bone and is sometimes accompanied by bone regeneration at the more organized fibrous periphery.

The type of reaction here reported is one which is familiar to the general pathologist. It is not different from the soft tissue granulomas often encountered following haemorrhage into the tissues, injury to body fat, injection of hydrolyzable oils into the tissues, and where the cholesterol and fatty acid content of epithelial cysts is extravasated into the surrounding tissues.

In the pathological differential diagnosis, giant cell tumour can be ruled out on two main counts: firstly, giant cell tumour does not occur in membranous bones and the frontal bone is developed in membrane; secondly, histologically, there is no reason whatever to consider giant cell tumour. Bone cyst and eucnchondroma can be ruled out on the same grounds as for the giant

cell tumour. Other possible tumours such as enchondral fibroma, fibro-sarcoma, xanthoma, fibro-xanthoma, myoangioma, perineural fibroma, parasitic cyst, angioma, myeloma, cholesteatoma, mucocoele, osteogenic sarcoma, and metastatic tumour can readily be ruled out by the histology of this lesion. It bears no resemblance, histologically, to fibrous dysplasia. Eosinophilic granuloma and Hand-Schüller-Christian's disease cannot be maintained as a diagnosis because there is not the reticulo-endothelial feature nor are there eosinophiles. No specific features of tuberculosis or syphilis can be demonstrated nor are there features of pyogenic granuloma. The one lesion that is most nearly simulated histologically is infarction in bone, but bone infarction, so far as we know, has been described only in the long bones where it never causes expansion.⁶ Moreover, infarction tends to calcify and ossify in time, producing a condensation of the bone as seen by the radiograph. The similarity of the histological appearance in post-traumatic granuloma and bone infarction can be accounted for by the antecedent haemorrhage and interference with the circulation followed by necrosis of the blood and marrow content. Just recently, we observed an identical type of reaction in an eye in which there had been a known haemorrhage separation of the retina following an injury.

SUMMARY

Two cases of "post-traumatic granuloma of the bony orbit simulating tumour" are presented. These cases are augmented by a third case showing the identical pathological process in a rib.

From the radiological point of view, they are characterized by an osteolytic lesion. Pathologically, when a haematoma takes place in a bone, with or without actual fracture, the sterile elements of broken down blood may act as a foreign body which often lies dormant apparently for many years, and may become "activated" following another injury, or may cause a slow, steady reaction over several years. This "reaction" results in a destructive, expansive, tumour-like lesion in the radiograph which is actually a chronic granuloma with many foam cells and a foreign-body multinucleated giant cell formation around elliptical crystal clefts, cholesterol crystals, haemosiderin, haematoxylin, and other haemoglobin pigments.

Surgically, they are very amenable to radical therapy.

We are indebted to: Dr. J. W. McKay, Radiology Department, Montreal General Hospital, for radiological advice. Dr. Wilder Penfield, Director of the Montreal Neurological Institute, for the report with drawings of the first operative case. Dr. D. L. Thomson, Prof. of Biochemistry, and Dean of Graduate Studies, McGill University, for his comments on the difficulty of assessing the morphology of the lipoid crystals which are here called elliptical crystal clefts.

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PROGRESS IN WAR MEDICINE SINCE 1939

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AS an introduction to discussing the various aspects of progress in war medicine since 1939 I should like to quote the two following comments:

"For the first time in the history of warfare there were more surgical than medical casualties. Strange as it may seem, in all past wars, disease has exacted a higher toll of manpower than has the trauma of conflict." (Col. William S. Middleton, M.C., U.S. Army, Chief Consultant in Medicine, E.T.C., U.S. Army.)

"The most important medical lesson learned in the past war, was that executive and combatant officers must be taught that the enforcement of hygienic measures, to preserve the health, morale and fighting efficiency of their troops, is as important as any other military duty." (Surgeon Vice-Admiral Sir Sheldon Dudley, K.C.B., F.R.S., Medical Director-General of the Royal Navy.)

BLOOD TRANSFUSION SERVICE

In view of the excellent work accomplished, I feel that some acknowledgment should be made of the organization planned and originated by Sir Lionel Whitby, to keep the British and Canadian Armies supplied with sufficient blood and plasma. Six months before the war, the British policy was established of having a distinct transfusion service which could produce its own equipment, its own blood substitutes, and supplies of stored blood, and which could train and earmark officers and orderlies especially for this work. The object was first to put all the material and equipment needed, into the hands

of those who had to use it, without calling upon them to obtain supplies on the spot; and secondly to ensure that they knew how to use these materials to best advantage.

The headquarters of this service was established at Bristol, under the supervision of Sir Lionel Whitby, and it worked most efficiently during the whole war. Base depots were established within easy reach of the Canadian hospitals in Great Britain, and then when our troops moved to Italy and Northwestern Europe, there was always an adequate supply of blood and blood substitutes near at hand. These were flown out from the main depot at Bristol, to a base transfusion unit in each theatre of operation.

By April 1945, Sir Lionel reported that the B.L.A. in Europe had received some 97,000 pints of blood, 51,000 pints of fluid plasma, and 133,000 pints of glucose saline. During the war, to April 1945, 2,000 British and Canadian officers received training at Bristol, and also 200 American officers. The results of this service were remarkable, when taken in conjunction with the life-saving measures which can complete the good work begun by the intelligent applications of transfusions; namely, prompt, efficient surgery, and the control of sepsis with penicillin and sulfonamides. The recovery rate of the wounded has been estimated to be from 80 to 95%. What a change from the story in the South African War, and in fact, also from World War I!

TETANUS

Perhaps the most dramatic advance in preventive medicine was encountered in the protection given by tetanus toxoid. As you will recall, it was given to all Canadian and American soldiers at the same time as the T.A.B. vaccine. To my knowledge, no authentic case of tetanus developed in the Canadian Army overseas, and Col. Wm. Middleton, Chief Consultant in Medicine, European theatre of operations, U.S. Army, is the authority for the statement that only one instance of tetanus occurred in the American Army.

The Nazis afforded the perfect control. Only the Luftwaffe and certain paratroop elements received tetanus toxoid. Of the unprotected German prisoners of war, hundreds developed tetanus, and scores died in allied hospitals. As Col. Middleton remarks "A hideous commentary on Nazi psychology and medicine!"

TYPHOID FEVER

The efficacy of typhoid vaccination was proved beyond a doubt, when one recalls the decimation of troops in the South African War from typhoid fever, and then compares that tragedy with World War II, when less than 50 instances of the disease occurred in an army of over three millions. Of these, only 2 died. In our own Canadian troops in Italy, typhoid fever did occur. The cases which I saw were front line troops, and had obviously been exposed to massive doses of *B. typhosus*. So far as I know, none of these cases died.

Incidentally, it is also interesting to record that Dr. C. A. Peters of Montreal was one of the first Canadians to receive a dose of typhoid vaccine in the South African War. According to him, the inoculation was followed by a terrific systemic reaction!

DIARRHOEA AND DYSENTERY

In any campaign waged in tropical countries, the three main problems are malaria, diarrhoea, and dysentery. To exemplify what preventive medicine did in World War II, as regards diarrhoea and dysentery, one has only to compare the mortality tables for the Civil War with those of the recent conflict.

	Total cases	Deaths
Civil War	1,585,196	44,558
World War II	24,171	267

This was accomplished by proper sanitation, boiling and chlorination of water, and the use of sulphonamides. Of the latter, sulfaguanidine, and succinyl sulfathiazole are the more preferred. The dose recommended is 3.5 gm. (52½ gr.) q. 8 hours until the stools are normal for four days.

GAS WARFARE

Although the threat was ever present, to my knowledge gas warfare was not indulged in by any country in the late conflict. Perhaps the only reason why the Germans did not use it, was that the Allies could return it to them three-fold! One of the most deadly gases known to be in the hands of the Germans was lewisite. As a result of this, the Allies worked feverishly to find an antidote. Thanks to the perseverance of Prof. R. A. Peters and his co-workers at Oxford, this was discovered, and the result was BAL (British anti-lewisite) known during the war as Ox 217 (2, 3 dimer-capo-propanol).

Fortunately, it was discovered that the above drug had a particular affinity for the arsenical radical in lewisite. As a result, experiments were made of its use in arsenical dermatitis, and we know now that it is a definite antidote in the following complications of arsenic therapy: (a) toxic encephalitis due to massive arsenotherapy; (b) agranulocytosis; (c) aplastic anaemia; (d) jaundice; (e) arsenical fever.

This drug is also beneficial in cases of mercurial poisoning. It is interesting to recall that it was Lieut.-Col. Sam Mirsky, of Ottawa, who was one of the first members of the R.C.A.M.C. to successfully treat a case of arsenical dermatitis with BAL. He may not recall it, but this incident took place at No. 8 Canadian General Hospital in April, 1944.

HEPATITIS

Of all the diseases which carried a high morbidity in the Allied armies, perhaps hepatitis was the most interesting. In Great Britain, the occurrence of jaundice in people following the injection of serum, was about the first event that began to arouse general interest. In 1937, I think it was, an outbreak of jaundice occurred in England in children inoculated with convalescent measles serum. A similar thing occurred in the winter of 1940-41, when soldiers were inoculated with convalescent mumps serum. However, it was not until a large number of cases of jaundice began to appear in American troops, who had been inoculated with yellow fever vaccine, that the army in Britain began to sit up and take notice. The Surgeon-General of the United States Army reported 28,585 instances of postvaccinal jaundice, with 62 deaths in the first six months of 1942. A check-up of the volunteers who contributed serum for the above vaccine showed at least one student to be suffering from infectious hepatitis.

The capitalization on the above experience has greatly advanced the knowledge of hepatic disorders. Also, substantial support in correlating the clinical and pathological findings has been derived from the studies done on punch biopsies of the liver by Dible, McMichael and Sherlock, at the British Medical Postgraduate School, Hammersmith. Much investigative work has also been done by Stokes and his co-workers in the United States, and the Medical Research Council Team in Great Britain.

It would now seem as if a virus etiology for the related, if not identical conditions, infective hepatitis, homologous serum jaundice, and post-arsphenamine hepatitis had been established. Neefe and Stokes have described what seems to have been a water-borne epidemic. Nevertheless it is probable that infection is usually transmitted by personal contact, dust, or droplet spread. The seasonal curve (October to March) is similar to that of droplet infection, and precludes transmission by flies. Although certain outbreaks have been associated with upper respiratory tract infections, the causal agent has not been effectively demonstrated in nasopharyngeal washings.

The incubation period is probably approximately one month, to be followed by the pre-icteric phase, which may last 5 to 10 days. Following this, the urine becomes dark, and the stools pale, then jaundice appears in the sclerotics and skin. Symptoms begin to improve when jaundice is fully developed. After 7 to 10 days the urine and stools regain their normal health 4 to 5 weeks after the onset of symptoms.

There may be wide variations from this typical course, both in severity and duration, especially in large epidemics. Although pre-icteric symptoms are sometimes inconspicuous, particularly in children, the majority of patients give a clear history of fever, or shivering, frontal or retro-orbital headaches, and pain in the limbs; high fever up to 103° F. may persist for several days. Anorexia and lassitude are almost invariable. Vomiting and upper abdominal pain or discomfort are common, and weight loss may be considerable. Urticaria, irritation of the skin, and erythematous rashes are occasionally encountered in the early stages. The liver is usually moderately enlarged and tender, and the spleen is palpable in 18 to 20% of the number of patients. Relapses occur in about 10% of cases and vary in degree.

Differential diagnosis.—In the pre-icteric stage, this includes other causes of obscure fever, such as influenza, meningitis, malaria, sand fly fever, and infectious mononucleosis. Abdominal pain may be so severe as to suggest appendicitis or perforated ulcer. Laboratory tests which may help, are bromsulphalein excretion, Hunter's test for bilirubinaemia, and the differential leucocytic count, which at this

stage shows a granulopenia. It may be hard to distinguish between a jaundice due to hepatitis and that which is part and parcel of an extrahepatic obstructive jaundice. The diagnosis of Weil's disease should be considered if purpuric spots are found, or if the blood picture shows a leucocytosis.

Laboratory findings.—In addition to other liver function tests, the serum bilirubin curve gives the most valuable information in regard to progress. It may be rising or falling, or may indicate the occurrence of a relapse, while clinical jaundice is showing little change.

Progress.—Complete recovery is the rule. Yellow atrophy develops in about 1 in 15,000 cases. Cirrhosis as a sequela is probably very rare.

HOMOLOGOUS SERUM JAUNDICE

It is now well recognized that the jaundice which follows plasma transfusions, or inoculation with measles convalescent serum, or with yellow fever vaccine is due to an infective agent present in human serum. The incubation period is about 100 days. Clinically and histologically, this type of jaundice is indistinguishable from infective hepatitis, but does not appear to be naturally infectious and the one disease does not confer immunity to the other.

Post-arsphenamine jaundice.—Jaundice following arsenotherapy appears to be of the same type as homologous serum jaundice, and is transmitted by means of syringes contaminated with blood from infected cases. This type of hepatitis tends to be more severe and more prolonged than the other forms.

Treatment.—Rest in bed until urine is bile free and liver enlargement has subsided. High protein, high COH diet. A fat free diet is not necessary. Therapy with amino acids, methionine and cysteine is of uncertain value. Human gamma globulin lessens the incidence of epidemic hepatitis. Brigadier John Palmer is the authority for stating that among the Canadian troops in Italy the average period of disability was 50 days. This period included hospital stay and convalescent depot until the man was fit for full duty.

According to statistical data kindly supplied by the Department of National Defence, the total number of cases of hepatitis occurring in the army from 1939 to September 1946, was 1,388. The number of deaths, 9.

RESPIRATORY TRACT INFECTIONS

1. *Influenza.*—So far as I know, no proved case of influenza due to virus A or B occurred in any of our Canadian hospitals overseas. However, supplies of specific vaccine were on hand to deal with any outbreak which might have appeared. An outbreak did occur in the American forces, and in the civilian population in November and December, 1943. The mortality was in old people rather than in the young.

2. *Lobar pneumonia.*—The incidence of true lobar pneumonia, due to a pneumococcus, was not as frequent in Canadian troops overseas as we had been accustomed to see it in our hospitals at home, considering the same age group. In one month, only 22 cases were discharged from a total of 24 hospitals.

3. *Primary atypical pneumonia.*—This type of pulmonary infection was of considerable interest to all of us, and proved to be the most common form of pneumonia that we experienced during our stay overseas. There is no need of my going into a detailed description of the disease, because there has been a great deal written about it in recent medical literature. I can only emphasize that in our experience it was an acute infection which usually resembled clinical influenza in its onset, and in which physical examination proved unsatisfactory, as far as actually knowing what was taking place in the lung parenchyma.

MALARIA

During the past campaign, malaria was not the scourge it was feared it might be, and this was because it was realized that the control of the disease was a military rather than a medical problem. It was a job for the C/O and officers of a unit to see that anti-malaria discipline was carried out. The medical officer had to ensure that the units were properly instructed as to how the necessary measures were to be carried out.

I think it has been proved that 0.1 gm. of atebriin daily, while it will not prevent a soldier from contracting malaria, will at least keep it suppressed and allow the man to carry on efficiently. The above dosage certainly will not cure the disease. This was shown by the problem that arose in regard to the troops brought back to Great Britain for the invasion of Europe. A great many cases of relapsing benign tertian malaria occurred, and this condition became a

major factor in the attrition of man power. With the faithful use of atebrin daily, this situation was overcome, and the drainage of fighting men stopped.

The total number of cases of malaria occurring in the Canadian Army, 1939 to 1946, was 6,349. There were no deaths from the disease.

SYPHILIS

The greatest advance made in the treatment of syphilis was the instituting of massive arsenotherapy, which was later followed by penicillin. At first, the 6-day course was initiated, and 1,300 mgm. of mapharsen were administered intravenously: 726 cases were treated to completion, and there were 4 deaths. It was then decided to conform to the type of treatment used in the American forces, and the 20-day treatment was instituted; 1,200 to 1,600 mgm. of mapharsen were given, and also 1.2 gm. of bismuth salicylate. Up until January, 1944, 487 cases had been treated, with no deaths.

Later in 1944, penicillin therapy was instituted. To quote Col. Middleton:

"The final test of time has not been applied, but 98.6% of syphilitic soldiers treated with penicillin (2,400,000 units, 60 intramuscular injections of 40,000 units each in $7\frac{1}{2}$ days) in the primary sero-negative stage were negative at the end of six months. The results in secondary and late syphilis were much less spectacular, and as we now know the quality has been raised to 4,000,000 units and combined with injections of bismuth."

To anyone who had to be responsible for seeing that the soldier's venereal disease card (M.F.I. 1247 S) was kept up to date, this institution of massive therapy was a godsend, and certainly marked a step forward in the care of the luetic soldier.

TUBERCULOSIS

With a large number of the Canadian soldiers coming from Western Canada, where the incidence of tuberculosis is relatively low, and where it is known that a considerable proportion of the young adult population has a negative tuberculin reaction, we were rather anxious as to what would happen when these same people were exposed to a considerable risk from infection. It will be recalled that beginning in 1939, a routine x-ray of the chest was taken of all recruits entering the Canadian Army. By this method, about 1% of the applicants were found to have pulmonary tuberculosis, and were rejected.

Statements also appeared from time to time purporting to show that tuberculosis was on the increase in Great Britain. Dr. Wingfield in an address at the Royal Society of Medicine in 1942 stated that the morbidity of tuberculosis in Britain was reckoned at 0.7% of the population —350,000 cases, and that actively infectious cases amounted to 250,000. It was also estimated that there were 10 active cases for every death from tuberculosis in a community, and that there were 19 cases of all kinds of tuberculosis for every death. Wing-Commander Trail, in his Varrier-Jones Memorial Lectures for 1942, showed that out of 30,130 young airmen examined by mass radiography, 0.22% had active pulmonary lesions, and 0.36% had inactive lesions. All these people had been passed as physically fit on routine physical examination. He estimated that 3 per 1,000 supposedly healthy young adults in Great Britain had active tuberculosis, 15,000 in all.

With that background, it may be interesting to know how the Canadians fared, especially the troops overseas. This in view of the fact that reports appeared during the war, in the *British Medical Journal*, stating that 20% of the milk supply of one provincial town contained acid fast bacilli, and that 40% of the dairy cattle in England and Wales were affected by tuberculosis. The total number of cases of all types of tuberculosis which occurred amongst Canadians overseas between 1939 and 1946 was 1,009. The deaths amounted to 19, or 1.9%. The incidence of tuberculosis of all types in the Canadian active army at home and overseas was, I understand, approximately 0.08%. The lessons learned were: (a) The absolute necessity of x-raying all recruits. (b) The necessity of examining and x-raying the contacts of all cases developing tuberculosis. (c) The rapidity with which the disease developed in apparently healthy young men. We were shocked at finding evidence of extensive pulmonary disease in men whose history did not date back more than three months. (d) The consideration of giving BCG vaccine to all recruits.

MENINGOCOCCÆMIA

The story of cerebrospinal meningitis and meningococcæmia in World War II was quite a different one from that in World War I. In the latter, the mortality was 38%. In the European theatre of operations the figure fell

from 5.3% in 1942 to 2.8% in 1944. This remarkable state of affairs was almost entirely due to the diagnostic awareness of the medical officers and the advent of the sulfa drugs and later, penicillin. The prophylactic use of sulfadiazine in this type of infection was equally spectacular to its therapeutic value. Amounts as small as 2 gm. a day, cleared the upper respiratory passages of meningococci. A total of 7 gm. in 3 days was all that was usually required. Antisera played no material rôle in the treatment of meningococcal infections.

The total number of cases occurring in the Canadian Army overseas between 1939-46 was 76, with a total mortality of 9; in other words, a mortality of 12%.

PSYCHIATRY

The guidance of all matters psychiatry in the Canadian Army overseas was, as you are aware, in the able hands of Col. F. H. Van Nostrand, O.B.E., V.D. and I am indebted to him for what I have to say on this subject.

There has probably been more muddled thinking and talking in connection with psychiatry than with any other branch of medicine. On both sides of the Atlantic there has been a tendency for psychiatry to dwell in a very rarefied atmosphere, having a language all its own, only interpreted to the general practitioner by the high priests of the cult. Even the nomenclature of psychiatric disease has no uniformity, and many of the terms would have no precise meaning except to the persons using them. This ultra-specialization of psychiatry may have been a good thing, but it was a definite handicap in setting up a rational psychiatric service in the army. Col. Van Nostrand attempted to anchor psychiatry firmly to medicine and surgery.

Between 5 to 10% of the routine admissions to general hospitals were psychiatric disabilities, although the admitting diagnosis was usually a medical or surgical one, such as low back pains, dyspepsia, etc.

It was also found most advantageous to have a trained psychiatrist at divisional level, but it was impossible to expect a high percentage of psychiatric casualties to return to combat levels. In 80% of these, there was definite evidence of constitutional predisposition and the stresses of service were only precipitating factors.

Col. Van Nostrand thinks that no discussion of lessons gained in this war is complete without some mention of psychiatry in relation to personnel selection. He contends that personnel selection was not something brought forward for the first time in this war. Ghengis Khan, early in the 13th century employed this method. Those of his following who were by temperament unsuited to fight were detailed to tend the flocks and herds, move the caravans, etc., and really formed the service corps of his army. He also employed many skilled tradesmen who did not bear arms.

The Canadian neuropsychiatrists who served overseas do not believe that any of the tests or batteries of tests currently in use to test recruits, accurately measure stability or the ability of a man to carry his anxieties without breakdown. They therefore think that rejection at the point of intake should not be too rigid, but that weeding out during training should be more ruthless, and re-allocation because of proved unfitness should be more widely used.

Col. Van Nostrand states that it is conceivable that by early teaching, propaganda, blood-and-guts military training, and ruthless weeding out of the unsuccessful, the British Commonwealth of Nations and the United States of America could produce an immense fighting force which would win its wars with very few psychiatric casualties. If this should happen, he believes that we shall find the results hateful, and the ultimate disadvantages will far outweigh the wartime advantages.

CONCLUSION

As one reviews the medical progress made during the recent conflict one is struck by the tempo of its evolution. On an impartial analysis it becomes obvious that much of this has resulted from a speeding-up of scientific developments. Most of the basic facts and discoveries antedated the war. Their rapid fruition, to quote Col. Middleton, was, in most instances, the result of perfect team work. It is up to us to try and carry this idea of co-operation and team work into civilian life: to think internationally, and not parochially, and to remember that "There never was a good war nor a bad peace".

RECURRING SYNCOPE IN PATIENTS OVER 45 YEARS OF AGE

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THIS paper is based on the records of 12 private patients, with ages ranging from 46 to 78 years, averaging 56; 7 were white collar workers, 3 workmen and 2 housewives. Their only complaint was of recurring, sudden spells of unconsciousness. Their history and their physical examination gave no clue to the origin of the syncopal attacks. All were active physically and were not short of breath; there was no particular rise in blood pressure or evidence of arteriosclerosis disproportionate to their ages in the peripheral or retinal arteries; no valvular or myocardial condition seemed responsible, even in the case of the only 2 patients who showed evidence of organic heart disease. The attacks were not fatal, usually not even serious. Six had no definite warning; a sudden weakness or dizziness or a curious epigastric sensation with nausea heralded by a second or two the onset in the others; 2 repeatedly sustained minor bruises, and one, falling from his veranda steps, broke his collar bone—very trifling mishaps considering the many dozens of syncopal attacks I have on record.

The loss of consciousness was complete, lasting for periods from only a few seconds to 10 minutes or thereabouts, generally apparently less than a couple of minutes, though one had to depend here mainly on the patient's or his friends' account. Within a minute or two the patient was usually himself, though sometimes upset and worried: vomiting occurred occasionally just at the end of an attack in 3 cases. Involuntary micturition, biting of the tongue and convulsive movements were never noted.

I witnessed 3 syncopal attacks, which occurred without warning, 2 brief, like petit mal seizures, with slow, regular and smallish pulse, the third complicated by a blow on the head in falling, with very slow pulse and respiration, prolonged unconsciousness and a passing amnesia for time and place on coming to.

Sudden movements of the head and neck, as in abruptly looking up, turning the head

sharply to one side or bending quickly seemed definitely in 3 cases to precipitate some of the attacks; tight collars were worn by 2 patients but no improvement occurred on correction of this habit. In only 4 of the 12 patients did attacks occur in the open air and even in these, the faints generally occurred in the house, occasionally in the office and only exceptionally in bed. None of the 3 workmen had attacks at their job.

Most of the patients were under observation for long periods (the main excuse for publishing so small a group): 4 were kept track of for over 20 years, 2 for 12 years and 3 others for 5 years, after the onset of syncopal seizures. Two patients have been very closely followed over many years. No deaths have occurred in this group, so far as I know, in syncope. In none of the cases was alcohol a factor. It would have been easy to increase the number of cases by inclusion of numerous patients over 45 suffering from recurring faint, dizzy attacks, short of actual unconsciousness, but the purely subjective nature of such spells renders the differential diagnosis much more difficult.

CASE 1

In 1905, on 5 or 6 occasions, I was called hurriedly next door to see a business man of 64, who had, without warning, attacks of syncope while standing or walking about his office. Seen within 2 to 3 minutes, he was pale but already recovering consciousness and was quite himself almost immediately. The cardiograph and the sphygmomanometer were alike unknown in Winnipeg at that date but ordinary physical examination was quite negative; he was not in the least short of breath. After some months, the syncopal attacks ceased without treatment; he remained in good health for many years, dying in 1928 of "myocarditis and arteriosclerosis", aged 88.

CASE 2

In 1908, an accountant, aged 49, without warning dropped unconscious in his office for a moment, vomiting as he came to. Eighteen months later, when I saw him for the first time, he had a similar attack in the evening. Physical examination all round was negative. Blood pressure 145 mm. Six months later, a third syncopal attack without warning or obvious exciting cause. In 1916, a similar experience; his last attack of unconsciousness occurred in 1922. All occurred at home or in the office; his mental and physical efficiency was unimpaired. He died in 1932 at the age of 73 of "cerebral haemorrhage".

CASE 3

Another business man, aged 46, had a number of syncopal attacks, following by some months an obscure illness, possibly encephalitis lethargica, in 1919; I found, in 1922, no explanation for the attacks. His heart responded to exercise normally. Blood pressure 140/95. In the next 10 years, he had, to my knowledge, some 3 sudden attacks of unconsciousness, one lasting 20 minutes. He is still alive and active.

CASE 4

Since 1936, I have seen on very many occasions a white collar worker, now aged 71. An active though not powerfully built man, he enjoyed excellent health till 1936, when sudden synopal attacks occurred, at first infrequently but soon several times a day, so that for some weeks, he had to remain at home. Thorough physical examination was quite negative, the cardiovascular system being quite normal for his years; cardiogram normal; Wassermann negative; fundi normal; hypoglycæmia was considered but after investigation ruled out. Pressure over the left carotid sinus abruptly slowed the heart markedly and lowered the blood pressure during the first half of the 25 second test but did not induce syncope. Pressure over the right sinus produced no effect.

A month's rest at home, with a subsequent holiday at the Coast, aided possibly by mebaral, 3 grains twice a day, was followed by complete disappearance of all attacks, for almost 10 years, during which he survived with ease an acute peptic ulcer with haemorrhage and a bronchopneumonic attack. In 1946, without obvious reason, he had a recurrence. Though he never stopped work, he had about a dozen attacks that year, which, however, disappeared, coincident with the use of dilantin, 1½ grains three times a day. This drug has been continued and in the last 6 months, he has had only 2 quite minor faints. General physical examination has remained negative; he looks no older than his years; an encephalogram was normal and the other tests, including the carotid sinus pressure test, remain as before.

I saw 2 of the attacks. In one, while playing bridge he suddenly lost consciousness for about half a minute, face pale and expressionless, pulse slow, regular and small, the cigar drooped but did not fall; he resumed play in a moment with his usual judgment. In the other attack, he dropped without warning while climbing stairs and bumped his head against a wooden step; he was unconscious for 3 or 4 minutes, quite pale with very slow pulse and respiration, dazed and sleepy for half an hour and then himself, save for a passing amnesia of time and place.

CASE 5

In 1936, a mechanic of 55 had some 6 synopal attacks in the preceding 6 months, all while working around the house, never at work; 2 ended in vomiting and were followed by passing dizziness. Slight cardiac enlargement with associated aortic regurgitation; blood pressure 170/90; Wassermann negative. Had been steadily at work without pain or shortness of breath. I felt that the aortic regurgitation had nothing to do with the attacks and reassured him. In April, 1948, his physician writes: "his attacks of faintness passed off in a few weeks after he saw you and have not returned. He has been in good health ever since; is now retired."

CASE 6

A mechanic of 52 was seen in 1941. Six years previously, he had fallen from a scaffold, fracturing the sternum and, it was found later, also the 12th dorsal vertebra. Soon after, he claimed synopal attacks began and continued at irregular intervals for the 6 years. All the attacks occurred in or around his house, never at work; he never was off work on their account and, in fact, did not report their occurrence till he had a synopal attack on his veranda steps and fell, breaking his collar bone. The previous attacks had been preceded by a sudden feeling of weakness and of objects going black. Physical examination all round negative. Blood pressure 145/95. Heart and arteries normal.

CASE 7

In 1946, a businessman, aged 52, came to me for a general check-up, which was satisfactory. In 1947, he had his first synopal attack while making a sudden

springing movement. His heart seemed normal, his blood pressure was 135/90. He was an active man and not short of breath but a cardiogram showed left bundle branch block with prolonged PR interval. An x-ray of the heart was normal, the great vessels' shadow broadened and a Wassermann was negative. Carotid sinus pressure slowed the heart and made the pulse smaller but did not induce syncope. He took life more easily and relaxed better but was given no medicine. Twelve, and again 18 months later, no change in the cardiogram was noted and he felt well, taking average exercise for his years. In 1945, he had 2 sudden faint attacks which passed off when he sat down and later, having recurring syncope, he was examined by another medical man who sent him to the Neurological Institute in Montreal where, in 1946, first one carotid sinus was denervated and then the other, after an encephalogram, x-ray of the skull, sugar tolerance test, etc., had been negative; in spite of mebaral, ½ grain twice a day, attacks recurred within 5 weeks and more than a dozen within a year of the operation. I have seen him repeatedly since the operation. The attacks seem frequently to be associated with sudden movements of his head and neck and possibly with tight collars; syncope occurred once in the barber's chair when being shaved.

It is worthy of note that the left bundle branch block and prolonged PR interval have remained unchanged for 5 years, unaccompanied by any clinical evidence of heart disease, in a man now aged 60, who has no particular shortness of breath on exertion.

CASE 8

A business man of 78 was examined by me in 1944. He had had 5 or 6 synopal attacks in the previous 2½ years, preceded by a curious numbness from the knees up. I found nothing to account for these attacks. Heart normal, blood pressure 150/85; cardiogram normal. He was given a tonic and advised to go slow. In 1947, his doctor reported "no recurrence of syncope, still working in store every day and very fit".

CASE 9

In 1941, I saw a housewife of 57. Twenty-three years previously for 3 or 4 years she had fallen unconscious without warning when standing or walking about the house; such attacks came half a dozen times a year, unconnected with menstruation and without obvious explanation. They let up entirely for 15 years, reoccurring in 1937, 4 years before I saw her. They still came without warning and still only in the house while standing or walking about. The unconsciousness lasted only a minute or two, leaving her fit apart from a passing feeling of weakness and, occasionally, minor bruises. She was a powerfully built woman with clinically normal heart and blood pressure. Fluoroscopic examination of the chest normal and Wassermann negative; the cardiogram suggested some myocardial damage. In April, 1948, her doctor reported: "the synopal attacks occur without warning but with lesser frequency in the last 7 years—possibly 3 or 4 times a year".

CASE 10

In 1930, I saw a housewife of 52 who had never been ill. In the previous 3 weeks she had had a number of attacks, without associated vertigo, of sudden momentary unconsciousness, coming only in bed when she made a sudden movement of the head. My general examination was quite negative all round.

CASE 11

A male teacher, aged 54, had 2 synopal attacks in the previous 24 hours without obvious explanation. Physical examination was negative: heart and blood pressure normal. He was still active 8 years later.

CASE 12

Recently a storekeeper of 60 was seen who had had some 6 synopal attacks in the last 18 months, all pre-

ceded by an uncomfortable feeling rising from the epigastrium, giving him sufficient time to sit down. Unconsciousness for a minute; nausea or vomiting on coming to; felt all right in 5 or 10 minutes. No explanation for the attacks, which all occurred indoors. Physical examination was quite negative. Blood pressure 130/85. Heart responded normally to exercise. Pressure over the carotid sinus did not affect his pulse rate or blood pressure and did not cause any disturbance of consciousness.

Diagnosis.—With recurring synopal attacks the diagnosis becomes narrowed. It is remarkable how seldom recurring syncope is due to organic heart disease, though in the literature, aortic regurgitation and, more recently, aortic stenosis are sometimes incriminated. Coronary thrombosis can be excluded by the absence of pain or associated breathlessness in spite of repeated faints: heart block by the history, repeated examination of the heart and by the cardiogram: petit mal by the onset after 45 and by the absence of involuntary micturition or biting of the tongue.

Vasovagal syncope is closely allied but occurs chiefly, though not solely, in young individuals when standing or sitting. The attacks, too, usually are obviously caused by overheated or crowded rooms, emotional stress, disturbing sights or news in individuals often in poor physical condition. The vasovagal syncopal attacks may in themselves be indistinguishable from those under consideration: usually warning in the shape of giddiness, dimness of vision, nausea, yawning, then complete unconsciousness with dilated pupils, heart slowing to 40 or 50 and blood pressure progressively falling; the faint lasts perhaps 2 to 10 minutes, leaving the patient limp, weak and perspiring. Even in older individuals, such vasovagal attacks do exceptionally occur under similar exciting causes.

Hypoglycæmia had to be specially considered on several occasions and sugar tolerance tests were performed on 2 patients. Involvement of the labyrinth or its paths was excluded by the absence of ear trouble and of true vertigo with rotation of objects.

Prognosis.—The prognosis is obviously excellent, so far as life is concerned. Physicians are inclined to be too pessimistic in their outlook on such cases. Frequently, the attacks are few and far between; sometimes they keep recurring for some months and then disappear as mysteriously as they came. There seems even in severe cases to be a natural tendency for the syncopal attacks to let up and even to

disappear, a point to be remembered in assessing the influence of treatment, whether medical or surgical. Only 2 of my patients have been seriously and then only temporarily disabled by the seizures.

Treatment.—The patient, whose confidence has been rudely shaken by his "heart attacks", can be reassured and encouraged to carry on. No special drug treatment is indicated if the attacks are infrequent: nothing tight should be worn around the neck: obvious infractions of a sensible mode of life—overwork, worry, excessive smoking—should be pointed out, though in my own cases no outstanding indiscretions were noted. When the attacks occur more frequently, the patient should be warned against turning his head quickly, looking up or stooping suddenly. In 2 of my cases, the faints were controlled or disappeared coincident with the use of dilantin, a grain and a half three times a day. In very frequently recurring seizures, Harry L. Smith, of the Mayo Clinic, recommends phenobarbital, a grain and a half times a day for 7 to 14 days, with diminishing doses thereafter.

Operative procedures which in recent years have been advocated in selected cases of recurring syncope, unrelieved by medical treatment, involve a consideration of the carotid sinus. The carotid sinus is the bulbous dilatation of the internal carotid artery just as it leaves the common carotid: it is readily palpated in most people just below the lower jaw, about the level of the upper edge of the thyroid cartilage. It is richly endowed with a network of nerve endings which transmit impulses, mainly by the nerve of Hering through the glossopharyngeal nerve but also by other fibres, to the vagus and vasomotor nuclei in the medulla. The sinus helps to regulate the rate of the heart, the height of the blood pressure and also to maintain an adequate circulation in the brain.

In an uncertain percentage of normal individuals, firm pressure with the finger on one carotid sinus against the spine for 25 seconds induces very definite slowing of the heart, a fall in systolic and diastolic blood pressure, or both: such changes occur more frequently in older persons and especially if hypertension or marked arteriosclerosis be present; men exhibit this hypersensitive carotid sinus reflex, as it is called, more readily than women. Now

many, though by no means all, patients with recurring syncope have a hypersensitive carotid sinus (sometimes only on one side), pressure on which reproduces all the features of the spontaneous attack, a reaction abolished by infiltration of the adventitia of the sinus with procaine. Hence, denervation of the affected sinus or sometimes section of the glossopharyngeal nerve has been performed with varying success. But the carotid sinus is not the only, though it is the most important, sensory receptor reflexly controlling the heart rate and the blood pressure; such reflex stimulation of the vagus nerve can also originate, e.g., from a diverticulum of the lower oesophagus, from an inflamed pharynx and from the bronchi. This fact may partially explain why operation, even in patients whose spontaneous attacks can be reproduced by digital pressure over the sinus, may fail to prevent recurrence.

A recent report from the Mayo Clinic may be summarized: 85 patients with "carotid sinus syncope"; ratio of males to females 5 to 1; average age 56 years; only in 21, was operation—a complete denervation of the sinus—performed with "not too satisfactory results".

Only in 3 of my recent cases was the carotid sinus test applied. In one with no result, in the other 2, with slowing of the heart and lowering of the blood pressure. Obviously the test should be performed with cardiograph and blood pressure apparatus in position, in order to get scientific results.

SUMMARY

Ten men and 2 women, of an average age of 56, complained of recurring syncope. Followed over many years, they showed no special indications of cardiovascular disease or of high blood pressure; such syncope is not dangerous, tends usually to disappear and is very seldom disabling. Exceptionally, denervation of a hypersensitive carotid sinus may be tried.

513 Medical Arts Bldg.

Nor yet did he know that ideas, no less than the living beings in whose mind they arise, must be begotten by parents not very unlike themselves, the most original still differing but slightly from the parents that have given rise to them. . . . He thought that ideas came into clever people's heads by a kind of spontaneous germination, without parentage in the thought of others or the course of observation.—*The Way of All Flesh*: Samuel Butler.

HYSEROSALPINGOGRAPHY*

Raymond Simard, M.D. and
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Montreal, Que.

AMONG the varied methods at our disposal for diagnosis in gynaecological morbid conditions, a very precious and at times indispensable aid is the use of uterosalpingography. The procedure is simple, innocuous, can be carried out on the ambulatory patient, and is remarkable for the clarity of the information it can give. It consists essentially in the visualization, by the use of a contrast medium, of the cervical canal, the cavity of the uterus and the lumen of the fallopian tubes as far as they are patent.

Its clinical value is due to the almost perfect mold it gives, of the cavities of the organs into which the contrast medium is injected; namely cervix, uterus, fallopian tubes, and to the permanent record one obtains and to which one can refer in the form of x-ray plates. Through these, a detailed and leisurely study may be performed of the cavities of the organs injected, which study can be done by no other known method.

Bi-manual examination, dilatation and curettage, even hysteroscopy, which, by the way, has never given any startling results or very precise information because the uterine cavity is only a potential one, can, together, give rich and varied data regarding the genital organs of a woman; but no known method, not even laparotomy, can give, so clearly and in detail, the information one can obtain from uterosalpingography. This technique has come as a definite complement to the ordinary methods of investigation, in simple cases, and in certain baffling conditions, where it gives indispensable information and a simple and clear solution to the problem.

Far from being a routine procedure, uterosalpingography has a definite place in gynaecological investigation. However most clinic patients in our department of gynaecology are subjected to this examination and we very often find lesions of the uterus or tubes or even

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cervix which we did not even suspect on ordinary physical examination.

The technique consists in the injection, under the fluoroscopic screen, of a radio-opaque viscous liquid into the cervical canal, and in following the flow of the liquid through the cervix into the uterine cavity, then through the uterine cavity into the fallopian tubes, and through the tubes into the peritoneal cavity when the tubes are patent. The whole procedure should be carried out under the fluoroscope, and we stress this rather than performing a blind injection of a few c.c. of liquid in the office and then taking films, for the following reasons: (1) One can control the injection and be sure that no liquid is extravasated into the vagina. (2) Mucography or visualization of the uterine mucosa can be obtained only by a filling of the uterine cavity under very low pressure so as not to stretch the mucosa by excessive filling and thus unfold its plicae. This must be done as the uterus is being slowly filled and under direct vision, rather than on evacuation, because evacuation is impossible to control and difficult to photograph. (3) Most important as far as uterography is concerned is the fact that if there should be a sessile or pedunculated growth in the uterus or cervix, under low pressure and at the beginning of the injection, the contrast medium will flow around the growth thus giving a filling defect which can be snapped on a film. As the injection progresses, the opaque liquid completely circumscribing the growth may show no deformity of the uterine cavity. These are some of the reasons why we consider it essential to inject the radio-opaque substance under direct vision, and to follow its progress into the cervix and uterus.

What are the advantages of uterosalpingography? (a) It will confirm a presumptive diagnosis of intra-uterine or intra-cervical lesions such as polyp, fibroid, carcinoma of cervix or body of the uterus. (b) It will permit a detailed radiological exploration of the Fallopian tubes. As a matter of fact radiological exploration of the Fallopian tubes is an important advancement in the study of tubal disease. Before this method was available, palpable lesions alone could be diagnosed. We had no method of estimating the degree of permeability of the tubes, the site of obstruction if any, the degree of mobility of the tubes and finally their retention of liquid (hydro-

salpinx). Clinically, one can estimate the gross modifications in the tubes, that is, those which are palpable. We have no information regarding the slight though important changes in their lumen, as well as greater or lesser permeability. As a matter of fact physical examination will reveal only fairly good-sized utero-adnexal masses. Any tubal lesion which is not palpable goes undiagnosed.

Salpingography shows not only the morphology of the tube, but permits one to study its position, its lumen, finally the ensemble of the tube. Every one knows that tubal insufflation can demonstrate the tube's permeability. All are cognizant of Rubin's experiments, who, while attempting to perform a pneumoperitoneum through the natural passages, stumbled on this ingenious way of testing the patency of the tubes. No doubt this test can detect an obstruction, but it is incapable of localizing it. Indeed this latter information is obtainable by no other method than uterosalpingography and is most important if one should entertain the intention of doing plastic surgery for tubal obstruction. Besides, air is compressible, liquids are not, and this compressibility can be a cause of error on a manometer or kymograph in estimating the flow of air through the tube. Tubal insufflation then, tells one if the tube is patent: nothing more.

(4) It acts as a therapeutic agent in opening non-patent tubes, the proof of which is evident by the numerous pregnancies which follow uterosalpingography in previously sterile women. (5) It permits one to make a differential diagnosis between a tumour of the organs with cavities such as cervix, uterus, tubes, and adnexal or parametrial tumours. This can be done more easily in large tumours protruding into or palpable through the abdomen, by encircling the palpable tumour on the skin with a pliable metal wire. Then one proceeds to inject the radio-opaque liquid into the uterus. The cavity of the uterus seen radiologically will be found to be at or near the centre of the area circumscribed by the wire in a uterine tumour, and definitely off centre in a tumour not of uterine origin. (6) To make a diagnosis of certain conditions which would be absolutely impossible to diagnose without this method. Examples of these are (a) carcinoma of endo-cervix or corpus with no history or symptoms usually

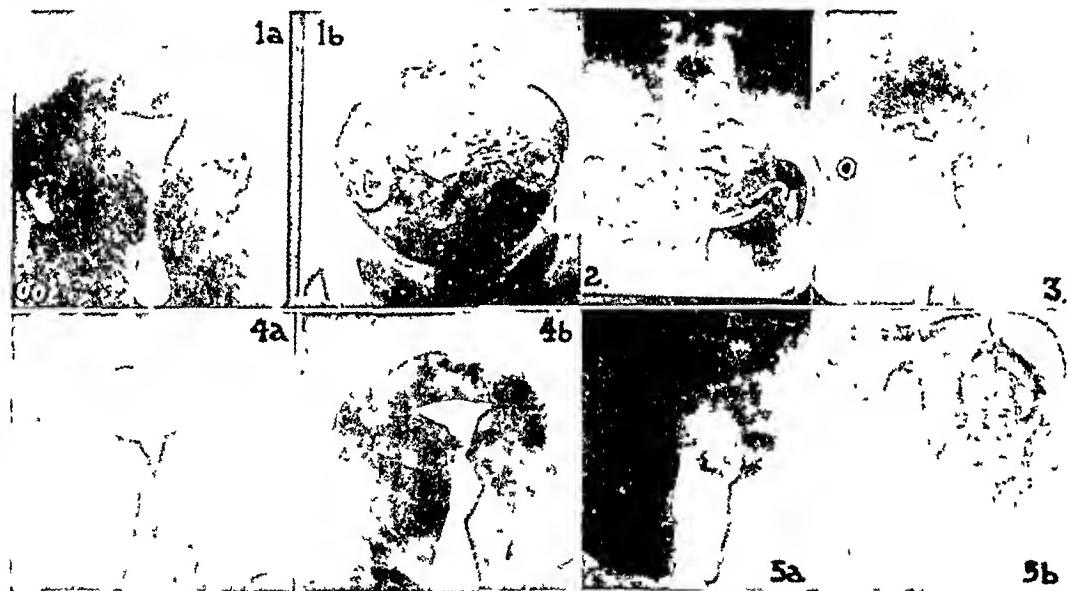
associated with these conditions. (b) intrauterine tumours in a uterus of normal size and contour, (c) certain cases of hydrosalpinx. (d) it permits one to obtain an image of the cavities of the pelvic generative organs, and also the external shape of these same organs. This information is particularly important in certain cases of pelvic tumour of uncertain origin, and is obtained by associating pneumoperitoneum with uterosalpingography. Also, the use of metal wire in large tumours of pelvic organs, as previously described, gives excellent information regarding the origin of these pelvic tumours.

What now are the contraindications to the use of this method of investigation? The only real contraindication is infection. If there should be any evidence of acute or recent in-

fection such as fever, chills, leucocytosis, high sedimentation rate, purulent lochia or purulent discharge from the uterus, acute infective vaginitis or urethritis, it stands to reason that the infection may be carried up and into the peritoneal cavity.

Clinical presentation.—Fig. 1a is the picture of a normal uterine cavity, showing the typical triangle the base of which is at the superior pole and the apex at the inferior pole of the uterus. Both tubes are well injected, of normal calibre, and one sees the characteristic puff of smoke at the ampulla where the radio-opaque substance flows into the peritoneal cavity. Fig. 1b, the control film taken 24 hours later, shows that large amounts of the liquid have penetrated into the peritoneal cavity.

Fig. 2.—The injection of radio-opaque substance shows very clearly the presence of two



fection such as fever, chills, leucocytosis, high sedimentation rate, purulent lochia or purulent discharge from the uterus, acute infective vaginitis or urethritis, it stands to reason that the infection may be carried up and into the peritoneal cavity.

Bleeding is no contraindication to uterosalpingography. As a matter of fact it may be necessary at times to use this method to find the cause of bleeding. However one must be on the lookout constantly for open blood sinuses in the cervix and uterus which would permit the intravascular injection of the contrast medium. This can be seen readily under the fluoroscope. We have had this "accident" occur at times, but without any untoward results. Also one should remember that intra-

uterine completely independent of each other. Only hysterosalpingography can show so perfectly the existence of this malformation, except of course, as in many lesions, laparotomy.

Fig. 3.—This film shows evidence of a large filling defect involving the whole cervical canal and most of the uterus except the bare fundal portion. This patient gave a history of amenorrhoea of 3 months' duration and of one severe haemorrhage with no subsequent bleeding and no subsequent enlargement of the uterus, though the amenorrhoea still continued for 2 months. Though this is a picture of retained placenta, it can easily be confused with an extensive carcinoma of the fundus because of the marked irregularity of the contour of the filling defect.

Fig. 4a, with incomplete filling shows an irregular growth occupying the entire cervical cavity. At the isthmus a filiform narrowing blends with the normal, though small, uterine cavity. Fig. 4b, with complete filling the lacuna in the cervical cavity is larger and takes on more definite shape. We have here an endocervical lesion, the presence of which we had completely ignored and did not even suspect until this examination. A D. and C. was performed on the strength of this picture and a report of adenocarcinoma of the cervix was returned from the pathological laboratory.

Fig. 5a shows a large filling defect beginning slightly above the cervical canal and involving the whole uterine cavity. This picture could be confused with that of an incomplete abortion, but the history combined with the radiological

paper and because of which we recommend slow filling of the uterus, under direct vision.

Fig. 7a shows a normal filling of the cervix and isthmus of uterus. At the fundus one notes a large filling defect which would indicate the presence of a tumour in the area. At operation we found a large serous cystic pouch of the left ovary which had ruptured previous to examination. Otherwise the genital organs were normal. On opening the uterus the large sessile myoma seen in Fig. 7b was found.

Fig. 8a.—Uterosalpingography shows a large filling defect at the fundus, semilunar in outline, corresponding probably to a fibroid. At laparotomy, nothing unusual was noted. On opening the uterus (Fig. 8b), unfortunately, incorrectly opened, one can see the submucous fibroid causing the filling defect at the fundus.



findings permits a quite definite diagnosis of intranterine tumour. At laparotomy a uterus of normal size and consistency was found, so much so that a hysterectomy was performed to see if a mistake in diagnosis had not been made. The intrauterine pedunculated fibroid was then found, arising from the region of the right horn and almost filling the whole cavity. Fig. 5b shows the uterus opened to expose the tumour diagnosed by uterography.

Fig. 6a at the beginning of the filling of the uterus one notes two filling defects involving most of the right side of the uterine cavity. Continued injection (Fig. 6b) obliterates the original filling defect as the opaque liquid surrounds the tumours, a fact we pointed out earlier in this

Fig. 9a shows a uterus normal in every way. The left tube is occluded at the horn. On the right, the tube fills as far as the ampulla. Here one notes a distension which takes on the appearance of a cluster of grapes. This picture is truly characteristic of a hydrosalpinx containing droplets of opaque oil. A control film (Fig. 9b) shows complete retention in the hydrosalpinx of the opaque medium.

Fig. 10a.—The filling of the uterus is normal. Both tubes are patent throughout their length. At the ampulla one notes the typical cluster of grapes picture which is so characteristic of hydrosalpinx. The film (Fig. 10b) taken 24 hours shows complete retention in the hydrosalpinx of oil with the typical mass.

ANATOMICAL BASIS FOR CONTINUOUS CAUDAL AND OTHER FORMS OF REGIONAL BLOCK IN OBSTETRICS

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REGIONAL block in obstetrics, in the form of continuous caudal analgesia, is being widely and successfully used in many of the larger American hospitals. It is a means of administering sufficient anaesthetic to completely relieve the pains of parturition without narcotizing the baby.^{1, 2, 3}

The seriousness of the effect of transplacental narcosis in reducing the oxygen supply to the baby's vital centres is now beyond question.^{4, 5, 6} Now this fetal hypoxia has been shown to be caused by ether,^{1, 2} nitrous oxide,^{6, 7} cyclopropane,^{1, 10} the usual rectal analgesic drugs,^{8, 9} and by scopolamine,^{1, 10} morphine,^{1, 11} the barbiturates,^{1, 3, 9, 12, 13, 14} and other brain-drugging agents in common use.^{2, 8, 9, 13 to 16} These agents have also been found to prolong labour.⁹ Prolonged hypoxia is capable of producing the same disastrous effect on the brain as transient anoxia.^{15, 16} Whether the degree of fetal hypoxia is dangerous or not is difficult to gauge because sufficient to depress the child's respiratory centre to the point of apnoea may show no appreciable effect on the mother.^{4, 13, 19} Fetal anoxia, (or asphyxia neonatorum) is well known to cause fetal death.^{3, 13, 14, 16, 17, 20} What is not so generally realized is that, if it does not kill, it may still cause irreparable damage to the child's brain.²¹ This damage is shown as areas of necrosis of the cortex in sections taken from cases which were known to have undergone short periods of anoxia, and died later from some other cause.¹⁸ This damage to the (more susceptible¹⁸) cortex is also apparent clinically in children who have survived the asphyxia, only to remain mentally inferior.^{19, 21, 22, 23, 66} This insidious danger to the race must be eliminated. Modern civilization, however, (after a century of anaesthesia) demands the relief of pain. The possibility of finding a general agent that will depress the mother's brain sufficiently to relieve the severe and prolonged pains of parturition without depressing too much the more delicate baby's brain seems remote.^{5, 13, 15, 24, 25} Therefore the knowledge

gained by scientific research along lines of regional anaesthesia should be carefully considered.

The experimental determination of the nervous connections of the uterus with the cord and and the introduction, in 1933, of the principle of prolonged blocking of these roots by repeated injections,²⁶ have made it possible to completely relieve the pain of parturition with the minimum of effect on mother and child. Thus the pain may be controlled throughout the main course of active labour and the child unaffected by premedication at the time of delivery. The extent to which this is true in the form of continuous caudal analgesia, using the technique established in 1942 by Drs. Robert A. Hingson^{26 to 25} and W. B. Edwards²⁷ was proved at the Philadelphia Lying-in Hospital. A statistical study of more than 2,500 deliveries, with caudal analgesia (averaging three hours in duration), as compared with a control group having the usual anaesthetics and sedatives was published in November, 1946, in United States Public Health Report No. 48.²⁸ This exhaustive analysis revealed an advantage (with no evidence of danger) for the mother of less than one-half the usual blood loss, shortened third stage, less morbidity, less after-pains and subinvolution, while cutting the infant mortality in half. That this is also found to be true in other medical centres similarly organized to apply the principle of prolonged regional block by those techniques^{29, 25, 27 to 45, 51} that permit careful anatomic control is apparent by reports published^{30, 42, 44, 46, 47, 61} and in the press.^{49, 50, 51} This method therefore should now be extended to more general use amongst well trained obstetricians and in smaller institutions. Believing that this would be the case if the scientific basis were better understood, and the existence of facilities for mastering a safe technique better known, this brief account of the experimental determination of the nervous connections of the uterus* is herewith presented.

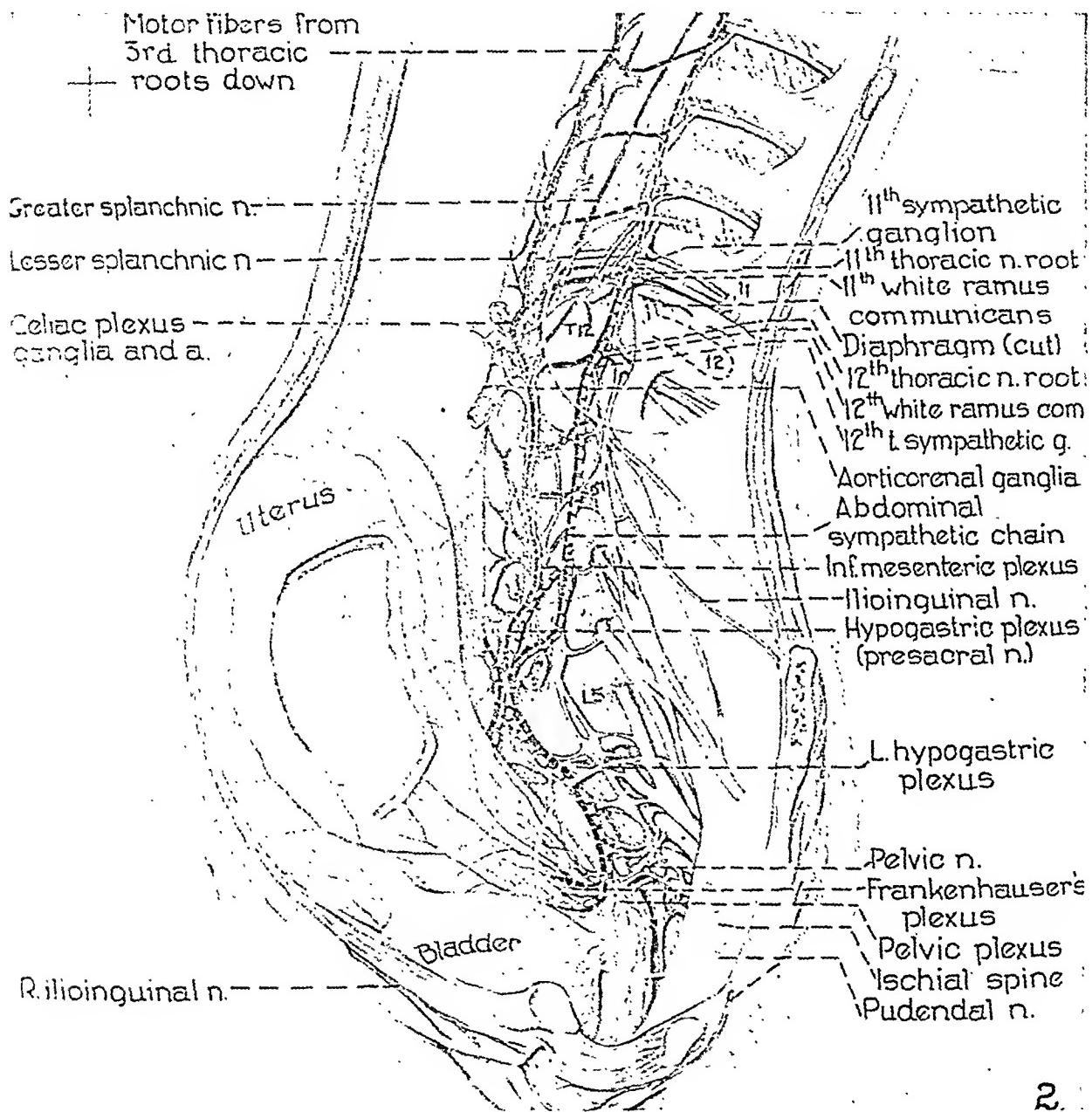
Regional anaesthesia in obstetrics rests upon a sound anatomical basis. This you must understand before attempting to block the sensory nerves in labour in order to avoid, or control the complications caused by involving the main motor nerves, and with them other vital fun-

* As given monthly by electrical transcription in Dr. Robert A. Hingson's postgraduate course in anaesthesiology at Johns Hopkins.

blocked with a quantity of anesthetic insufficient to affect other structures. The techniques developed were based on anatomical studies at the University of Oregon anatomy laboratory* and autopsy rooms† by dissections and methylene-blue injections. As little as $2\frac{1}{2}$ c.c. was found sufficient to fill the paravertebral space to in-

plexus. Obviously the usual dose of 20 to 30 c.c.¹ would effect this.

In developing these techniques the necessity of avoiding penetration of the dura was considered and the intradural injection of a dye solution that jelled when cold demonstrated that in the lower thoracic and upper lumbar region



clude the rami communicantes but not the sympathetic chain, and as little as 6 c.c. at a measured distance from the back of the transverse process, sufficient to block the lumbar sympathetic chain without affecting the aortic

* Thanks are due to the University of Oregon Medical School Department of Anatomy.

† Thanks are due to Dr. Warren Hunter and the Department of Pathology, University of Oregon.

the dura did not extend beyond the intervertebral foramina.* Judging by the results of the first hundred attempts at paravertebral block over the upper four transverse processes, in at least 87% all the uterine sensory fibres were proved to be contained in the lumbar sym-

* Thanks are due to Dr. Olof Larsell, Professor of Anatomy, University of Oregon.

pathetic chain by the complete relief of all pain of uterine contraction.

The sensory pathway from the uterus was followed from the presaeral nerve through the IV and III lumbar sympathetic and along the chain to the XII and XI thoracic roots via the rami communicantes as shown in Fig. 2 by the *broken white line*. All the pain fibres were more constantly blocked when the lumbar sympathetic was injected at or above the level of the L. III transverse process. The sensory pathway from the birth canal was followed into S. IV, III and 2nd roots.

MOTOR SUPPLY TO THE UTERUS

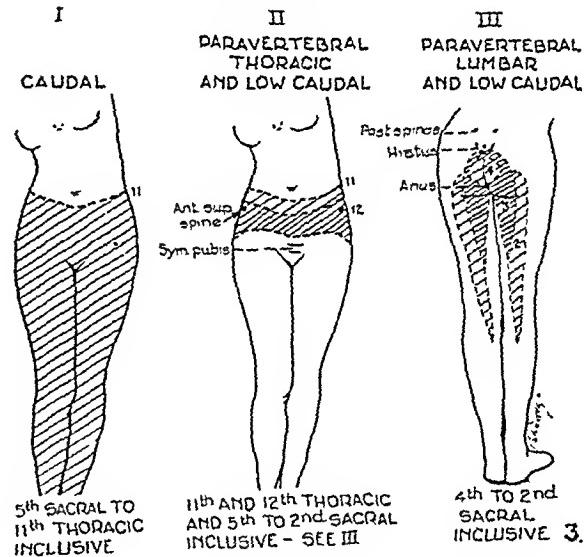
The motor nerves to the uterus (*shown in black dotted lines, Fig. 2*) were studied by hysteroscopic tracings on a kymograph* (Fig. 1) recording the actual intra-uterine pressure during contractions of labour under the influence of (a) caudal block at various levels compared with those under (b) paravertebral block of the XI and XII roots, and (c) paravertebral lumbar sympathetic and (d) combinations of paravertebral with low caudal, all compared with painful labour before and after. Studies of these tracings show that paravertebral block of thoracic XI and XII while abolishing the pain of contraction, does not inhibit the motor activity. High caudal and paravertebral lumbar were seen to depress the strength of contractions somewhat *except in late labour*, the depression in caudal being proportionate to the height of analgesia reached, and decidedly greater above the XI.

These experimental findings were confirmed in the course of routine clinical observations over a period of years. Whenever loss of motor power beyond the transient effect of adrenalin or ephedrine was noted, it was carefully analyzed in relation to the nerves involved and the other routine data such as frequency and duration of contractions, blood pressure, pulse and fetal heart, dilatation of cervix and station of presenting part, tonus of the uterus, all compared with the rest of the course of labour.

Judging by more than fifty instances of loss of motor power, ranging from $\frac{1}{2}$ hour of mild inhibition to complete arrest of labour, the following tentative deductions were made: (1)

The motor supply from the cord to the uterus is extraordinarily wide, extending from the III thoracic to the II lumbar (possibly L. III) *as shown in broken black line, Fig. 2.* (2) From the nerve roots the motor fibres course partly through the sympathetic chain, partly through the aortic plexus to the ganglia alongside the cervix^{55, 56} where they synapse with the *intrinsic* nerve-supply. (3) Motor impulses from the higher centres are much more effective by comparison than those derived from the higher centres in animals; and conversely, the motor centre in the lumbar cord is comparatively less effective: thus explaining the practicability of caudal anaesthesia in which the lumbar

ANALGESIA



enlargement must be blocked to reach the pain-carrying nerve roots. (4) The lumbar motor centre is sufficiently important, however, that if caudal is given too early it will depress the strength of contractions, and may arrest labour, and if given over too long a period of time may depress the tone of the uterus. (5) If caudal is postponed (while the lumbar motor centre is allowed to act) until labour is well established, the more powerful stream of impulses from the higher centres will then carry on labour until the intrinsic motor supply has taken over towards the end of labour, when it is possible for labour to proceed automatically to deliver even when the entire extrinsic motor supply has been cut off. This explains the success, in spite of large doses, of those who tried caudal before the determination of the

* Thanks are due to the University of Oregon, Physiology Department.

sensory supply of the uterus, when they used it *only* in late labour or for operative delivery.

SKIN AREAS OF ANALGESIA

I would like to emphasize the importance of the practical application of this research in administering continuous eaudal analgesia. Fig. 3 shows the average level of the top of the XIth thoracic skin segment which must be anaesthetized before complete relief of all pain in eaudal is attained. From careful measurements in 30 patients it averages $1\frac{1}{4}$ inches below the umbilicus. If you do not start eaudal too soon, and do not inject so much as to carry the analgesia above the umbilicus, labour will progress satisfactorily. To estimate the size of the initial dose of metocaine correctly I have found pelvic measurements to be a useful index, and by checking the level of analgesia resulting, that the use of two-thirds of the corrected initial dose will maintain the analgesia below the tenth thoracic, (thus to avoid paralyzing the coeliac plexus which is supplied by the Xth with the 9th thoracic through the lesser splanchnic nerves).

If you fail to be guided by the level of analgesia in continuous eaudal you may, unwittingly, involve the main splanchnic nerves with the attendant danger of profound fall of blood-pressure, which may cause serious fetal⁵ and even maternal complications. These may be difficult to combat,⁶ and therefore must be prevented by techniques that permit careful anatomic control. It was to eliminate the inherent necessity of subjecting the child to the anoxemia which accompanies analgesics and general anaesthetics in doses adequate to control pain, that these researches to perfect an alternate method that inherently protects the child, have been, and still are being carried on.

NOTE.—The extensive bibliographic references shown in the text may be had on application to the author.

I am indebted to Miss Bertha B. Hallam, Librarian, and staff, of Oregon Medical School Library for active co-operation in discovering, locating and sending literature on this subject over fifteen years.

For the physician there is only one rule: put yourself in the patient's place.—Lord Lister.

A NUTRITION SURVEY ON A NOVA SCOTIAN ISLAND

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FOOD supplies in Canada during 1944-46 were about enough to feed everyone adequately if distributed equitably. In a country like Canada, such distribution is difficult, and pockets of underfeeding are to be expected. It is important to practitioner and public health officer alike to know something of the extent and nature of any malnutrition resulting among the underfed. In addition there are those malnourished by reason of conditioning factors such as occupation, age and disturbed digestion. It is therefore important to estimate from time to time how many actual cases of malnutrition exist in the population and how many people are in a border-line condition, liable at any time to cross over the ill-defined zone into actual debility.

This paper reports a survey among fishing-farming folk on an island close to the coast of the Atlantic province of Nova Scotia. It is of special interest because the general conditions are not unlike those described for Newfoundland and for the Gaspé, as well as for other parts of the Maritimes. The diagnoses reported here differ rather sharply, however, from the report of a recent survey in Newfoundland,¹ and one for the Gaspé.²

Disagreement with results by other investigators is not unexpected in the field of mild malnutrition, in which diagnoses are so difficult that there has arisen the illogical term of "subclinical" conditions. Under this term are sometimes listed only dietary studies or a few blood analyses, or just lists of symptoms or signs. Such individual procedures do not yield diagnoses, and therefore conjure up shadowy pictures rather than defining the state of health in a manner permitting comparison. If there is observable impairment of function or tissue then the matter is within the clinical sphere, and if nothing can be observed, then it is only speculation.

A few deaths are recorded every year in Canada as primarily due to certain deficiency diseases. Confining attention only to those certified by physicians shows that rickets leads

all the rest by a long margin. Rickets is a preventable disease by means of administration of cod liver oil or some other source of vitamin D to all children regularly. Rickets was encountered in the present survey in a considerable percentage of children, including one frank case, while very few cases were indicated in Newfoundland or the Gaspé Peninsula by the above noted investigators. Both Newfoundland and Gaspé reports noted extensive incidences of signs attributed to deficiencies of vitamins B or C. In this report only two persons considered to have definite riboflavin deficiency (and another two with ascorbic deficiency) were found, and none with definite deficiencies of thiamine or niacin. Several others were found to have probable deficiencies of these factors, however.

METHODS AND MATERIAL

Madame Island is in the Strait of Canso off the southeast coast of Cape Breton Island. About 4,000 people live on the island, and live chiefly by fishing. They are chiefly of Acadian, French-speaking origin, and live in small settlements around the coastline. Transportation is by road or boat and large stores are lacking. Electricity is available, but many items such as coal are expensive.

The group surveyed (105 families) had an average size of 5.0 members, of whom only 359 completed the survey. The ages ranged from 1 to 77 years, with those over 45 forming 18.9% of the total. The sample represented about one person in 10 on the island.

Diet records for a one-week period were obtained between February 19 and March 18, 1947. Sixty-eight per cent of those who kept records later kept appointments for the clinical part of the survey; this is good considering the amount of snow and the difficulties of transportation.

The methods generally were the same as those described before.³ In the physical inspection weights and heights were taken with outer clothing and shoes removed. Children were stripped to the waist so as to examine posture, rickets, etc. The physical inspection included in each case a thorough examination of skin, nails, tongue, gums, lips and eyes, a measurement of the amount of subcutaneous tissue and observation of certain tendon reflexes and vibratory sense, and inspection of the teeth,

tonsils, throat and thyroid gland. Blood pressure readings were taken for most adults and many children.

RESULTS

1. Food habits.—The foods most lacking in the diets at the time of the survey were milk, all fruits (but especially citrus fruits or tomatoes), whole grain cereals, cheese, and fish liver oil. Very little use was being made of iodized salt, but this is not so important for a community by the sea. In addition to these more neglected food groups, the intake of vegetables other than potatoes, of bread and eggs, showed room for improvement.

The lack of milk and cheese together seriously jeopardizes the chances of a satisfactory intake of calcium and riboflavin. Calcium is especially important for children, who may also have insufficient protein for growth if their milk intake is unsatisfactory. The cost of milk on this island was probably one reason for the lack of this item in the diet. Citrus fruits and tomatoes are the most uniform source of ascorbic acid in the diet, while other fruits and various vegetables provide an additional, although irregular, source. The neglect of these two groups was only partly offset, as far as ascorbic acid is concerned, by a relatively good intake of potatoes and green and yellow vegetables. The lack of fruits may be partly unavailability at the season of the survey, and partly due to their cost. The neglect of cereals other than bread limits the intake of thiamine and iron, thereby increasing the possibility of thiamine deficiency and anaemia.

The fish liver oil intake must be examined by age groups, rather than as a single figure. Even in the youngest age group (0 to 5) there were 37% not getting enough fish liver oil; this is reflected in the indications of rickets in the whole group (including adults) of 13%.

2. Quality of the diets as a whole.—The diets have been classified into four categories:

	Percentage of total
Good diets:	
Above minimum in all of 8 food groups ...	5.5
Borderline diets:	
Minimum or below in 1, 2 or 3 food groups.	76.0
Poor diets:	
Minimum or below in 4, 5 or 6 food groups.	18.5
Extremely poor diets:	
Minimum or below in 7 or all food groups. 0.0	

The minimum score for any food group is already weighted for importance and represents in fact less than half the amount of that group that is currently recommended as optimal for the highest requirement anyone might have. In compiling the table, only a limited number of food groups was chosen, viz.: milk; citrus fruit and tomatoes; potatoes; green, yellow and other vegetables; whole grain cereals; bread; meat and alternates; fish liver oils (included only for those 12 and under).

This particular selection of seven or eight foods was made because the neglect of any one may have important effects on the health of the individual. The likelihood of deleterious effects increases with an increasing number of food groups falling into the minimum or below (including zero) category. If four or more of the eight groups are minimum or below in any individual's diet, that person is definitely eating a poor diet and is very likely to become malnourished. The table shows that 18.5% fell in this category, although none of these was eating an extremely poor diet. For the middle 76% of the persons there is a good possibility that improved diets would make a distinct contribution to health. Only 5.5% were in the zone of dietary safety, and even these fell below some of the current recommendations for a good diet.

3. Results of physical inspections. — (a) Heights and weights. There are still no completely satisfactory methods of interpreting height and weight measurements, even though thousands are performed annually. For children it is better to compare one measurement with a previous one on the same child, rather than comparison with a table. For adults the tables are also of uncertain standardization. In children underweight and thinness are often forerunners of severe illness. In adults both underweight and overweight are associated with higher rates of some diseases and with shorter life than those nearer average. Weights may be average, or above or below the average. Within 10% above or below the average may still represent a zone of "normality", and not be a special threat to longevity.

Among children aged 5 to 18, 6.8% of the males and 25.3% of the females were more than 10% below the Baldwin-Wood standards; 2.7% of the males and 3.2% of the females were more

than 20% below the standards. On the other hand, 10.9% of the males and 9.5% of the females were more than 10% above the standards.

Among adults, 40.8% of the males and 34.4% of the females were more than 10% below the standards, with 11.5% of the females more than 20% below; 10.2% of the males and 27.1% of the females were more than 10% above, with 16.7% of the females more than 20% above. From these figures one might infer that many females 5 to 18 were likely to be below optimal

TABLE I.
COMPARISON OF WEIGHT IN PERCENTAGE OF STANDARD
WEIGHT FOR GIVEN AGE AND HEIGHT
AGE 5 TO 18 (BALDWIN-WOOD STANDARDS)

Percentage of standard weight for age and height	No.	Males %	Females No.	Females %
Above average				
20 or more	1	1.4	2	2.1
10 to 19.9.....	7	9.5	7	7.4
0 to 9.9.....	22	29.7	17	17.9
Exactly average.....	4	5.4	8	8.4
Below average				
0 to -9.9.....	33	44.6	34	35.5
-10 to -19.9.....	5	6.8	24	25.3
-20 or less.....	2	2.7	3	3.2
AGE OVER 18 (MEDICO-ACTUARIAL STUDY)				
Above average				
20 or more.....	3	6.1	16	16.7
10 to 19.9.....	2	4.1	10	10.4
0 to 9.9.....	9	18.4	14	14.6
Exactly average—none				
Below average				
0 to -9.9.....	15	30.6	23	24.0
-10 to -19.9.....	18	36.7	22	22.9
-20 or less.....	2	4.1	11	11.5

weight, much more so than the males of the same age group. Both male and female adults tended to have low body weights, but there was much more variation of body weight among the women.

This result might be "normal" for the group studied, having regard to heredity factors in body build, except for the extreme variation. The figures are roughly similar to those reported for Newfoundland,² having actually more people of low body weight, but also more of high body weight.

(b) General physical findings (see Table II).—

About one person in ten had some form of respiratory infection at the time of examination, while more than one in four had enlarged or infected tonsils. These, occurring more commonly among children, were undoubtedly responsible for much ill health. A large percentage showed blood pressure readings usually considered above normal, although more than

TABLE II.
INCIDENCE OF CERTAIN FINDINGS NOT USED
IN THE DIAGNOSIS OF MALNUTRITION

Condition	Moderate	Marked	Severe
Respiratory infection.....	9.6	0	0
Enlarged and/or infected tonsils.....	21.8	4.4	0
Underdevelopment.....	0.8	0	0
Enlarged thyroid.....	2.6	0	0
Scabies.....	0.6	0	0
Conjunctivitis.....	1.4	0	0
Mottled teeth.....	0	0	0
Evidence of heart disease..	0	0	0
Below average blood pressure: adults	3.5	0	0
children.....	3.1	0	0
Above average blood pressure (persons 18 and over)*	29.7	4.5	0

*Criteria

Moderate: 140-179 systolic or 90-109 diastolic
 Marked: 180-229 " " 110-129 "
 Severe: 230 + " " 130 + "

one reading would be necessary to determine if this condition were more than temporary in all cases.

(c) *Signs of nutritional significance.*—A table listing individual signs is not given because it gives a false sense of constituting diagnoses. Such a table is available from the authors. Table III gives the incidence of conditions related to nutrition.

TABLE III.

SHOWING THE INCIDENCE IN PERCENTAGE OF FOUR GENERAL CONDITIONS WHICH ARE TO SOME EXTENT RELATED TO POOR NUTRITION

	Moderate	Severe	Extreme	Total
Thinness.....	4.1	0	0	4.1
Obesity.....	8.6	0	0	8.6
Carious teeth.....	39.0	13.3	0.8	53.1
Poor posture.....	33.2	1.4	0	34.6

Thickness and obesity in Table III were based on the general appearance, plus a weight more than 10% below or above average, plus a subcutaneous tissue measurement according to the following, as determined from the distribution curves.

Age group	5 to 11	12 to 17	18 & over
	Males		
Deficient.....	7 & under	5 & under	4 & under
Excessive.....	17 & over	15 & over	14 & over
Females			
Deficient.....	0 & under	9 & under	9 & under
Excessive.....	17 & over	19 & over	29 & over

The figures represent the thickness of a double layer of skin and subcutaneous tissue as taken up in a fold about two inches above the elbow, and measured in millimetres.

Carious teeth were estimated by the use of a tongue depressor only, and include decayed, missing or filled. Since "moderate" refers to more than four carious teeth this is a very limited picture of this condition.

Hæmoglobin.—Table IV gives the hæmoglobin values by age and sex. The average value of children under 12 was 12.4 gm. per 100 c.c. which may be compared with values like 12.8 for children in British Columbia or 13.3 gm. in Saskatchewan, as obtained by the same method.

TABLE IV.
HÆMOGLOBIN VALUES BY AGE AND SEX

No.	Average gm. per 100 c.c.	Range gm. per 100 c.c.	Standard deviation
Under 12 years.....	109	12.4	9.7-14.3
Males 12 and over..	86	13.8	11.9-15.7
Females 12 and over	162	12.7	7.3-15.7
357			

Serum ascorbic acid.—Table V gives the results of this estimation by age groups. It will be noted that extremely low and extremely high values occurred in all age groups. Of the whole group 28.7% had values below 0.4 mgm. per 100 c.c. which some people consider as the lower limit of normal. These estimations were made in March, and very few of the people were using any citrus fruit or tomatoes, yet the average level of each age group was not particularly unsatisfactory. Individual cases whose source of vitamin C did not include citrus fruits, had some of the high blood levels.

TABLE V.
ASCORBIC ACID VALUES BY AGE GROUP

Age	Number	Average mgm. per 100 c.c.	Range mgm. per 100 c.c.
0-5	24	0.76	0.22-2.03
6-11	73	0.70	0.02-1.79
12-29	91	0.64	0.03-2.03
30-44	44	0.55	0.08-1.59
45 plus	46	0.52	0.02-2.14
Total	278	0.63	

These findings must be considered with the finding of 14% of the whole group with red and swollen gums, which are reported to occur more frequently on low intake levels of ascorbic acid, even though not cured by it.⁴

The numbers and percentages of persons with definite malnutrition diagnosed by special criteria³ are given in Table VI.

to produce malnutrition. The quality was worse among children under 12, and among larger families.

Dr. L. Richter, Dalhousie University, in the course of studying costs of rural health services, initiated the idea of this nutrition survey.

Grateful acknowledgment is made of the assistance of Misses Helen Sackville, Dorothea Tripp, Doris Norman, Edith Perkins, Karen Porsild, Velma Tugman, and clerks and stenographers, all of the Nutrition Division. The support of Father Poirier, Father Boucher, and Father Boudreau greatly facilitated our work. The public health nurse for the county, Miss Blanche Martel, was also most helpful.

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VITAMIN C CONTENT OF DIETS OF LOWER INCOME TORONTO FAMILIES*

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OUR purpose in this study was to find out how much vitamin C was eaten daily by 113 children and adults living at home in Toronto during the late winter months of 1948. We wished also to determine how much of this vitamin was derived from Canadian and how much from imported foods.

In the dietary surveys carried out in 5 Canadian cities in 1939 and 1943,¹ a deficiency of vitamin C was a common finding. In these surveys the amount of this vitamin was calculated from food tables. In the present study the food as prepared for eating was collected and its vitamin C content was determined by chemical assay, as this provides a more accurate measure of the intake than the use of food tables.

There are only four reasonably-priced Canadian foods² that contain high or even moderate amounts of vitamin C. These are cabbage, turnips, tomatoes (raw, factory canned or juiced) and potatoes that have been stored less than four months. Except for the "fresh" potatoes, these foods are available throughout most of the year. Unfortunately when cabbage, tur-

nips or potatoes are cooked, much of this vitamin is usually lost.³ Four raw Canadian fruits, strawberries, raspberries, currants and cantaloupe also contain high amounts of this vitamin,² but they are relatively dear and are available for a short season only. The other members of the cabbage family² are even richer in vitamin C than cabbage but again they are expensive and available for only a short time in the year.

Present study—selection of families.—The 64 families used in the present study all included children who were serving as control subjects in the Canadian Red Cross Society's school meal study. In other words, these children ate all their meals at home and they were not given any special education in the choice of their food. We are much indebted to the staff engaged in that study for their assistance.

The income earned by the fathers or mothers and in two instances by both parents in these families, which were of Anglo-Saxon descent for the most part, is shown in Table I. In

TABLE I.
INCOME OF FAMILIES PER YEAR (SPRING, 1948)

Under \$1,100.....	3.5% of families
From \$1,100 to \$1,500.....	12.5% "
" \$1,500 " \$2,500.....	70.0% " "
" \$2,500 " \$3,600.....	14.0% " "

6 of the families the income came from relief, pensions, or a combination of the two. It is evident from Table I that most of the families had incomes from \$1,500 to \$2,500 per annum, the commonest wage (in 17% of them) being \$2,000. So far as dependent children were concerned, 52% of the families had one or two such children, 33% had 3 or 4, and 15% had 5 to 8. As any older children who were working contributed at most only enough money to cover their board and lodging, their wages have not been included in the above figures. The information on the family incomes was obtained by the senior author who interviewed the families in their homes.

Method of collection of food.—This investigation was carried out between January 12 and March 23, 1948.

The mother was visited in her home by the dietitian (M.G.), and she was asked how much citrus fruit or citrus fruit juice or tomato juice the child had eaten in the previous twenty-four hours. She was instructed not to change the amount of these particular foods in the fol-

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lowing 24 hours during which the food was to be collected. This precaution was taken because in a few preliminary trials some of the mothers had fed their families abnormally large amounts of these foods following the interview with the dietitian. In other words, these mothers wished to make a good showing in the test and in order to do so they departed from their usual practices. In most cases when asked to keep the intake of citrus fruits or tomatoes at the previous level, the mother followed these instructions faithfully. In no case did she reduce the amounts used. She was asked to start collecting the child's food when he returned from school that afternoon, and to continue doing so until after his noon meal the next day. If the child ate an orange or part of a grapefruit, she was asked to save another orange or grapefruit from the same lot. She was given a watertight cardboard carton into which the same amount of orange juice, grapefruit juice or tomato juice as the child drank was to be put. (None used both citrus juice and tomato juice.) This carton was to be kept as cold as possible, preferably in a refrigerator. Previous studies¹ had shown that there is little loss of vitamin C in such foods in 24 hours, even when kept at room temperature.

During the same 24-hour period, she was asked to cook an extra serving of all the foods containing vegetables or fruits. She was given a large-mouthed bottle containing 300 c.c. of 3% metaphosphoric acid into which she was asked to put as much of the fruits and vegetables, or foods containing them, such as jam, marmalade, soup, pickles, catsup, etc., as the child ate, in the state in which they were eaten. Dried fruits, such as raisins, currants or peel when present in baked goods were not collected. She was asked not to put beets in the bottle as their red colour interferes with the subsequent chemical test. Fortunately cooked beets contain small amounts of vitamin C (about 4 mgm. per 100 gm.) and they were rarely served by these families. If the fruits or vegetables were combined with other foods the mother was asked to remove the vegetable or fruit from the combination and to place only the vegetable or fruit in the bottle. For instance, if the child had eaten apple pie, the apple filling from a duplicate piece was scraped out and put in the bottle. Foods which were known to contain negligible amounts of ascorbic acid, such as milk, bread, cereals, butter,

cheese, meat, eggs and sugar were not collected because their inclusion dilutes the concentration to such an extent that the subsequent assay is less accurate.

The mother was also asked to record in household measures (cups, tablespoons, etc.) as accurately as possible all the food the child ate during the 24-hour collection period. The food collected was picked up soon after the last meal, which was eaten at noon. At this time the dietitian checked over the food record to make sure that all the foods containing fruits and vegetables had been collected in the manner outlined above. The mother was given 25 cents to cover the cost of this food. In 11 families, the food eaten by 2 children was collected separately. In two-thirds of these cases, one of the children was 7 to 10 years older than the younger child (whose age varied from 7 to 11 years). The meals eaten by the two children varied considerably, as in half of these pairs of children there was a difference of 40 mgm. or more in their intakes of vitamin C. In addition, 37 of the mothers and 2 fathers collected separately in the same way, the fruit and vegetable-containing foods that they had eaten during the same period.

Method of determining vitamin C in foods collected.—The weight of the food plus the metaphosphoric acid was determined in the laboratory and sufficient additional 3% metaphosphoric acid was added to bring the proportions up to 3 parts of food to 7 parts of acid. The mixture was then blended for 2 minutes in a Waring blender. Evelyn's method, using dichlorophenol-indophenol and his photoelectric-colorimeter as modified by Jackson and Drake,² was used for the determination of vitamin C. The amount of vitamin C in the edible portion of the citrus fruits or the citrus or tomato juices was determined in a similar manner.

The age of the subjects.—The age of the subjects is shown in Table II. It is seen that all but one of the children were from 7 to 20 years of age, the majority (85%) being between 7 and 12 years.

VITAMIN C OBTAINED IN THE CANADIAN FOODS EATEN

The amounts of vitamin C per day obtained by 96 individuals from Canadian foods only, is shown in Table III. Seventeen other individuals ate raw or cooked imported cabbage

in addition to Canadian grown vegetables and fruits. Their intakes of vitamin C will be discussed later in the section under imported foods and they are not included in Table III.

TABLE II.
AGES OF SUBJECTS

Age of subjects	Number of children and adults	Recommended daily allowances of vitamin C—in mgm. ⁵	Percentage of subjects eating daily allowances or more
4-6 years.....	1	50	0
7-9 years.....	37	60	40
10-12 years.....	26	75	38
13-20 years (girls)	3	80	0
13-15 years (boys).....	3	90	33
16-20 years (boys).....	4	100	0
Adults.....	39	70-women 75-men	5

TABLE III.
MILLIGRAMS VITAMIN C PER DAY IN THE
CANADIAN FOODS EATEN

mgm.	Number eating these amounts
0 to 5	27
6 to 15	45
16 to 30.....	14
31 to 40	9
41 to 50	1

CANADIAN FRUITS AND VEGETABLES EATEN AND THEIR EFFECTS ON THE VITAMIN C INTAKE

1. *Potatoes*.—Twelve children and 8 adults, or 20 in all, of the 113 subjects did not eat potatoes during the day of collection. Twelve subjects (2 of them adults) ate potatoes twice during this day. Eight of these 12 individuals ingested 13 mgm. or less of vitamin C in their Canadian foods during the day. The remaining 4 ate cabbage or tomatoes also, which raised their vitamin C intakes. It is obvious therefore that these cooked potatoes at this time of year added very little vitamin C to the diet. The potatoes were served mashed by about 55% of the subjects. Boiled peeled potatoes were served by about 26%, and other methods made up the remainder. Previous investigators have shown that when potatoes are peeled and boiled about 50% of their vitamin C is lost. When they are mashed in addition, a further loss of some 25% occurs.

2. *Turnips*.—Thirteen subjects (12%) ate cooked turnips, usually mashed, two-thirds of them taking servings of 2 to 4 tablespoons in

size. When taken in these generous amounts, the turnips resulted in a definite improvement in the vitamin C intake, as these individuals received from 16 to 39 mgm. of this vitamin in their Canadian foods per day.

3. *Tinned tomatoes and tomato juice*.—Thirteen individuals (12%) ate tinned tomatoes or tomato juice in varying amounts. Their intakes of vitamin C varied from 11 to 44 milligrams per day, including tomatoes in any form.

4. *Apples*.—Forty-six individuals (41%) used apples during the day. Two-thirds of them ate the apples uncooked and the usual amount was 1 apple. Thirteen had applesauce, one had a baked apple and 2 used apple juice (not vitaminized). From studying the vitamin C assays on the Canadian foods eaten, it was evident that apples added very little of this vitamin to the diet.

5. *Carrots, canned peaches, canned corn, canned peaches, canned pears*.—These foods were used by many of the families but in 35 samples where these foods were the main fruits or vegetables in addition to potatoes, only 4 contained more than 10 mgm. of vitamin C in the Canadian foods eaten during the day. The four highest ranged from 11 to 14 mgm. Therefore these foods add little of this vitamin to the diet.

VITAMIN C FROM IMPORTED FRUIT AND VEGETABLES

Thirty-seven, or one-half, of the children had oranges, grapefruit or their juices in the day's diet. The amount of vitamin C obtained from these citrus fruits by these children is shown in Table IV. The use of such citrus fruits

TABLE IV.
DAILY INTAKE OF VITAMIN C FROM CITRUS
FRUITS, OR THEIR JUICES

mgm.	Number of children	Number of adults
Under 30.....	2	1
31 to 40.....	4	3
41 to 50.....	4	2
51 to 60.....	10	0
61 to 70.....	3	0
71 to 80.....	4	1
81 to 90.....	4	0
91 to 100.....	5	0
Over 100.....	1	0

raised these children's total intake of vitamin C to between 37 and 178 mgm. Bananas were eaten in addition by several of the children and alone in two cases. In the latter, the total daily

intakes were 20 to 30 milligrams (one and two bananas) respectively.

Only 7 adults (1/6th of them) ate either oranges or grapefruit or their juices. The amount of vitamin C that these foods added to their diet is shown in Table IV. Their total daily intakes of vitamin C varied between 37 and 99 milligrams. The great advantage of including citrus fruits or their juices in the diet is easily seen.

Seventeen individuals ate raw or cooked imported cabbage. Their intakes of vitamin C in Canadian foods plus the cabbage were as follows: 4 ate 11 to 15 mgm., 7 ate 16 to 30 mgm., 5 ate 31 to 40 mgm. and 1 ate 46 mgm. When these figures are compared with those in Table III it is evident that the use of this imported cabbage improves the intake of vitamin C considerably.

TOTAL DAILY INTAKES OF VITAMIN C

The total daily intake of vitamin C of all the subjects is shown in Table V. This of course

TABLE V.
TOTAL DAILY INTAKE OF VITAMIN C

mgm.	Number of children	Percentage of children
0 to 5	12	16
6 to 20	16	21
21 to 30	5	7
31 to 40	3	4
41 to 50	5	7
51 to 60	5	7
61 to 70	4	5
Over 70	24	32

mgm.	Number of adults	Percentage of adults
0 to 5	8	20
6 to 20	23	59
21 to 30	1	3
31 to 40	1	3
41 to 50	2	5
51 to 60	1	3
61 to 70	1	3
Over 70	2	5

includes that obtained from both domestic and imported fruits and vegetables.

It is obvious that far more of the children than of the adults are eating diets containing over 70 mgm. In Table II is shown the percentage of children of different ages who ate the amounts of vitamin C recommended by the Food and Nutrition Board, National Research Council (U.S.A.).⁵ To return to Table V, 16%

of the children and 20% of the adults received less than 5 mgm. The U.S. Food and Drug Administration has set 20 mgm. as the minimum daily requirement of vitamin C for children 1 to 11 years of age. For children over 12 and adults it is set at 30 mgm. Eighty-two per cent of the adults ate less than this amount. Of the children, 39% under 12 years ate less than 20 mgm. and 38% of the children 12 to 20 years ate less than 30 mgm.

SUMMARY

1. The amount of vitamin C eaten in 24 hours by 74 children (85% between 7 and 12 years) and 39 adults was determined by collecting the food as served and assaying it chemically. The income of 70% of these families ranged from \$1,500 to \$2,500 per year (spring 1948).

2. It was found that the Canadian foods (including tomatoes) eaten provided meagre amounts of vitamin C. About 73% of the subjects ate 15 mgm. or less of vitamin C in such foods. Only one individual ate more than 40 mgm. of vitamin C in Canadian foods (44 mgm.).

3. One-half of the children and one-sixth of the adults used citrus fruits or their juices during the day the food was collected. These foods alone added 30 to 100 mgm. of vitamin C to the daily diet.

4. The total daily intake of vitamin C was very low, less than 5 mgm., in 16% of the children and 20% of the adults. In 22% of the children and 62% of the adults the intake was a little higher, ranging between 5 mgm. and the minimum daily requirements laid down by the U.S. Food and Drug Administration (20 mgm for children under 11 years, 30 mgm. for older children and adults). In other words, a total of 38% of the children and 82% of the adults ate less than the minimum daily requirement. The more generous daily allowances recommended by the Food and Nutrition Board of the National Research Council (U.S.A.) were attained by only 5% of the adults and 33% of the children. The amounts recommended vary from 50 to 100 mgm. for the children, depending on their ages, and 70 to 75 mgm. for the adults.

5. From this study it is evident that a large percentage of the Canadian population during the late winter months eat small amounts of vitamin C.

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NOVOCAIN IN ABDOMINAL SURGERY*

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THE use of novocain in abdominal surgery is not generally practised, due to ignorance of its possibilities; and to an impression that if used, elaborate methods of blocking sympathetic chains are needed. Actually, its possibilities are great: and the technique of using it is easy and straightforward. Moreover, it provides certain valuable advantages in obtaining relaxation when used to supplement other types of anaesthetic which merit consideration.

The present paper is based on personal experience and observation: and although not statistical, covers many hundreds of cases.

TECHNIQUE

A. General—applying to all abdominal work.—The drug used in most cases is $\frac{1}{2}\%$ novocain plus adrenalin. Metyeaine has also been used successfully. The skin and muscle of the abdominal wall must be adequately infiltrated, either in the line of the incision (and this must be a band sufficiently wide to insert sutures in the anaesthetic area) or as a lozenge shape inclosing the area of incision. In addition, we usually inject extra novocain at three or four points far lateral to the incision deeply in the abdominal muscles. It is important to inject solution into the muscle at either side of the incision (most easily by a fanning-out tech-

nique) to permit good muscular relaxation; but I have found that the extra injections far out on the abdominal wall are very valuable in giving extra relaxation.

As soon as the local injection is finished, skin, fascia and muscle are divided as deep as the peritoneum and bleeders are clamped immediately. A small incision is now made in the peritoneum and through this, about 200 c.c. of $\frac{1}{2}\%$ novocain are poured through a catheter and funnel. This small opening in the peritoneum is now closed with a clamp to prevent escape of novocain. The 200 c.c. of novocain now free in the peritoneal cavity diffuses widely and acts quickly. While this is happening, we go back and tie the bleeders. By this time anaesthesia should be complete. The patient can be placed in the Trendelenberg position if desired; the peritoneum is opened in the usual way and the operation continued. By doing it in this order, there is no need to wait or delay. It is true that the peritoneal cavity can be opened widely and then the novocain poured into the open cavity but this usually wastes a certain amount of solution.

B. Special—additional intra-abdominal procedures suited to particular operations.—(1) Appendix: It is usually worth injecting a few drops of novocain into the meso-appendix. (2) Hysterectomy: Some novocain should be injected between the layers of the broad ligaments laterally. This serves admirably for subtotal hysterectomy. If total hysterectomy is to be done, it is necessary to inject the para-cervical tissues through the vault of the vagina. We always do this before draping the abdomen, with the patient in lithotomy position, using a speculum and tenaculum and long needle. We do this at the same time that we paint the vagina with gentian violet (which latter procedure is always done by us before doing any total hysterectomy) so that injection of the novocain takes only a few seconds of time extra. (3) Gastrectomy: In addition to the general technique and the use of novocain solution in the abdominal cavity we have found that a useful accessory is to inject novocain just beneath the peritoneum of the posterior abdominal wall in the mid-line, just superior to the transverse meso-colon. The exact position is not important; but enough should be injected to raise a large bleb under the posterior peritoneum of the lesser sac.

* An address delivered at the First Scientific Session of the British Columbia Surgical Society, Vancouver, B.C., September 16, 1947.

This greatly prolongs the duration of the anaesthesia. It is not necessary to use elaborate procedures to inject the sympathetic chain. (4) Bowel resection: or anastomosis, etc. The previous general technique is sufficient. (5) Cæsarean: No adrenalin is used lest it inhibit uterine contraction; otherwise standard general method. It is not necessary to inject the uterus. In lower segment section it is necessary to inject under the fold of the bladder peritoneum. (6) Gall bladder: I do not believe it feasible to use local anaesthesia for gall bladder operations. But a valuable accessory to whatever anaesthetic being used, is to infiltrate the subcostal margins deep enough to block the intercostal nerves. This takes but a few moments and completely relaxes the upper abdominal muscles.

PRE-MEDICATION AND PREPARATION

We never mention the term "local anaesthesia" before operation as this invariably produces a vision or recollection of suffering in a dental chair. If she insists on discussing the anaesthetic, we simply say it will not be a spinal and that she will be comfortably asleep. The majority of patients do not know before or after operation that they have had local anaesthesia.

Adequate sedation is just as necessary here as in a spinal anaesthetic. We have used various combinations preoperatively: (a) Morphine, hyoscine and nembutal in combination. (b) Sodium amytal intravenous (Appleby technique). (c) Avertin.

All of these prove adequate and satisfactory in the majority of cases but with all of them there is the possibility that the patient may be restless or noisy or not sufficiently sleepy, so that it may be necessary occasionally to supplement with other procedures such as additional morphine intravenously, ether in small quantities (often only for a very short time) gas-oxygen etc. This is the disadvantage of the method; so we have sought for a more perfect and controllable type of sedative.

We think we have found it in the use of continuous pentothal during operations. Dr. Bruce MacKay has developed this technique by giving only a small amount of sedative preoperatively; then starting a continuous saline infusion into the vein in the operating room; into the rubber tubing of this he can inject

pentothal as required—just sufficient to keep the patient quiet and lightly asleep. Much smaller quantities than the usual anaesthetic amount is required since the novocain provides the anaesthetic. It is rare to need more than 0.5 gm., even in long operations. Rarely do Cæsarean sections require more than 0.1 or 0.2 gm. Cyclopropane with oxygen has been used instead of pentothal.

Advantages of local anaesthesia.—Low anaesthetic risk especially for poor risk patients. No nausea or vomiting. No postoperative headache as in spinal. No shock. No poisoning. I will state that in the many cases I have used this technique there has never been the slightest suggestion of novocain poisoning. Excellent muscle relaxation if the muscles are adequately injected. Excellent retraction of intestine. One of the very remarkable features is the way in which the gut contracts and shrinks up (more strikingly even than it does in spinal anaesthesia). We are accustomed to working in the abdomen without packs and without retractors; and the relaxation of both muscles and intestines is so good with this method that we are able to do this. In the usual pelvic operations with the patient in the Trendelenberg position we never see a loop of intestine unless we look for one. Rare post-operative distension.

Disadvantages.—Unless pentothal is used, the sedative does not always prove sufficient and so may require extra sedation or general anaesthesia. Requires more patience and a gentle technique (although from a patient's standpoint this may not be entirely disadvantageous).

Types of successful cases.—Hernia; appendix (if not ruptured); ovarian cyst; hysterectomy (if not obese); there is distinctly less pain in lifting the uterus and pulling the ligaments when novocain is used than is the case with spinal anaesthesia. Bowel resection. Cæsarean section. Gastrectomy.

I would particularly stress its suitability in ovarian cyst, hysterectomy and gastrectomy, and Cæsarean, in all of which we regard it as the anaesthetic of choice.

Contraindications.—Children and extreme nervousness. Infection (abdominal wall, peritonitis, salpingitis). Blood in the abdomen, as in ectopic. Perforated ulcer. Where there is pulling and dissection of tissue as in Gilliam and frozen pelvis (although we have done a

few cases of adherent tubes, we do not count on it being suitable for this).

As a relaxant in other anaesthetics.—The most striking features in the use of novocain as described above is the beautifully relaxed abdominal muscles and the almost phenomenal retraction of gut. Giving extra anaesthetic does not abolish these advantages: nor does the administration of other anaesthetic first, prevent the surgeon obtaining this relaxation if he uses novocain later. Therefore, regardless of the type of anaesthetic used, it is possible to obtain *extra* relaxation and *extra* retraction over and above that obtained from the original anaesthetic. We have all had cases (especially with ether) with tight muscles and straining guts, where the surgeon has to fight every inch of the way. In the majority of cases, if this condition arises it can be corrected quickly by injecting abdominal muscles with novocain even in a crude way, and pouring a cup full of ½% novocain into the abdomen.

The injecting of muscles is particularly valuable in upper abdominal surgery. In cases of distended bowel, even just pouring a cup full of novocain into the abdomen without taking the time to inject muscles, will result in rapid shrinking of gut and will simplify the work of the surgeon. In cases where spinal anaesthetic may have failed, worn off, or proved insufficient the use of local anaesthesia in addition will save the day; or if the surgeon wants still more retraction of bowel than what the spinal provides, he can pour in novocain and get still more retraction of bowel.

If a non-relaxing anaesthetic is used (such as gas oxygen or pentothal) abdominal surgery is difficult unless some additional agent is used to relax the muscle. Curare has been widely used for this purpose at the present time: but novocain provides a simple and safe alternative to curare.

We are now back to the same position we were some time ago having reached there by another route. First we started with novocain as the anaesthetic and concluded that continuous pentothal or gas-oxygen was the ideal sedative to use in association. If we start with pentothal as our anaesthetic, we find novocain an excellent relaxant to supplement it. By whichever argument you arrive, this combination proves safe and satisfactory.

SUMMARY

An attempt has been made to show how novocain can be used as an anaesthetic in a wide field of abdominal surgery. Attention is drawn to its usefulness in providing both muscular relaxation and shrinking of bowel to small size: and it is pointed out that these advantages can be obtained by using novocain as an adjunct to any other type of anaesthetic used in abdominal surgery. It is here that we feel it has its greatest use, as it can be called upon at short notice at any stage during an operation, to provide whatever extra relaxation is required.

TOCOPHEROL (VITAMIN E) THERAPY IN SCLEROSIS OF THE LEGS WITH ULCER*

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WITH the knowledge that vitamin E complex (mixed tocopherols) exerts a profound influence on the collagenous degenerations (for which the name "collagenoses" seems appropriate), following its use in a case of ulcero-nodular granuloma of the legs compatible with a diagnosis of necrobiosis lipoidica diabetorum,¹ and in lupus erythematosus²—amongst other degenerative processes—our attention was directed toward leg ulcers, because in these cases we were impressed with the degree and frequency with which sclerosis of the legs could be demonstrated both clinically and histopathologically.

The following cases are reported:

CASE 1

P.G., male, aged 50, was admitted to hospital on May 15, 1947, with ulceration of both legs with some surrounding eczematoid dermatitis of three months' duration. There was a history of recurring ulcers over the past year. Under intramuscular injections of penicillin and wet dressings locally he was discharged on May 31, with the ulcers much improved. He also received some insulin by injection because his blood sugar was slightly elevated, although he was not diabetic. Biopsy was made from tissue taken in the ulcer area on May 28. He was re-admitted on June 9, because of recurrence of deeper ulceration and oedema in the left leg and for the purpose of intensive tocopherol therapy. The integument of both legs was thickened and had lost its elasticity particularly in the lower halves.

On June 13, a second biopsy, made in the middle third of the left leg by scalpel, was difficult to approximate because of the obvious impairment of elasticity of the skin, the edges falling apart and persisting as an

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ulcerative process. Beginning June 11, he was given 200 mgm. of vitamin E complex (tocopherol) by injection every second day and 150 mgm. tocopherol daily by mouth. Penicillin and insulin therapy were given as on his previous admission. Marked improvement occurred and the skin of the leg became progressively and demonstrably more pliable and soft.

A third biopsy was done on July 2 (3 weeks later) in the neighbourhood of the second biopsy, with scalpel; the edges were coapted easily and the area later healed without difficulty (Fig. 1). A progress note on July 8 states "Skin of the legs is almost normal in feel—the elasticity of the skin has returned and it can now be picked up". Complete healing occurred and he was discharged on July 13.



Fig. 1. (Case 1).—Biopsy ulcer (lower wound) 3½ weeks after incision. Second biopsy wound (upper lesion) four days after operation, following tocopherol therapy.

First biopsy made May 28, 1947, on tissue removed from the margin of the ulcer showed markedly thickened skin. At one end of the section there was a narrow margin of the ulcer in the floor of which there was indolent granulation tissue composed almost entirely of endothelial cells with numerous closely packed capillary vessels lined by hypertrophic endothelium. There was only moderate exudate of lymphocytes and polymorphonuclears and very little evidence of circulating blood, and no fibroblastic proliferation except at the margin of the ulcer. In the remainder of the section the following distinct features are noticeable (Figs. 2, 3 and 4).

1. Marked acanthosis and hyperkeratosis of the epidermis.

2. A subepidermal zone comprising the zona papillaris and upper margin of the reticularis in which there is a very evident increase in the capillary plexus. Some of these vessels are dilated and filled with blood; others are collapsed and give the impression of sprouting. The lining endothelial cells are hypertrophied. Throughout this zone there is a moderate infiltration with lymphocytes and a few eosinophiles and a proliferation of fixed tissue cells. Some of the collagen bundles appear normal, others are swollen and fragmented. Haemosiderin deposition is quite noticeable.

3. A marked swelling of the collagen bundles in the lower two-thirds of the corium. The capillary vessels in this zone are lined by large endothelial cells and for the most part are collapsed. About them there is mild lymphocytic infiltration and some haemosiderin pigment.

A second biopsy made on June 13, on tissue removed well away from the ulcer shows the same changes in the epidermis and subepidermal zone as in the first biopsy, but in addition there were minute hemorrhages and a

more marked deposition of haemosiderin. This zone merges with a cellular dense fibrous tissue becoming more compacted toward the deep margin of the corium. Coursing through this zone are compressed capillary vessels lined by hypertrophied endothelial cells and about which there is mild lymphocytic infiltration and considerable haemosiderin. There is one isolated area of massively swollen collagen in which there is a small hemorrhage.

From these two biopsies made before treatment the thickening and hardening of the skin can be accounted for by the collagenous swelling, the proliferative fibrosis and inflammatory reaction and to a lesser extent by the acanthosis and hyperkeratosis. The discoloration is due to the deposition of haemosiderin. Of particular note are the vascular changes with escape of blood from which the haemosiderin is derived. It is possible that this pigment plays a part in the provocation of the fibrosis.

A third biopsy (Fig. 5) was made on July 2, on tissue removed from a site adjacent to the second biopsy. The skin compared with the previous biopsies is about half as thick and appears almost normal. There is only slight collagen swelling along its deep margin. The capillary vessels are now inconspicuous and there is only slight perivascular deposits of hemosiderin and lymphocytic infiltration. It is interesting that elastic tissue stains show an abundance of elastica in the zona reticularis ending abruptly at its upper margin with none in the zona papillaris.

CASE 2

D.S., male, aged 59, had been wounded by shrapnel in the lower left leg in 1918 and had a compound fracture. Since then there had been some pigmentation in the area. In 1936 he developed an ulcer in this leg and has since had numerous admissions to the hospital because of recurrent ulcers in both legs. He had had a left saphenous ligation done in 1944. On admission September 2, 1947 both legs were deeply pigmented and a large ulcer of six months' duration was present in the lower third of the left leg which resisted healing. Both legs were obviously markedly sclerosed and hide-bound in their lower halves with scar formation as a result of old ulcers. Amputation of the left leg was considered at this time. A biopsy was made on September 4 and, as in other such cases, the wound broke down to produce a typical leg ulcer (Fig. 6). Over a ten-week period he received 36 injections of vitamin E complex of 200 mgm. each and 600 mgm. daily of tocopherol by mouth. No local treatment was given and he was up and about during this time. There was complete healing and a marked improvement in the softness and pliability of the skin.

Following discharge he was kept on wheat germ and vitamin E complex (100 mgm. daily) and three months later the skin had lost some pigment and became considerably more pliable, though still obviously sclerosed.

The first and only biopsy (Figs. 7 and 8) was made on tissue taken well away from the ulcer on September 4, 1947. The sections consist of thickened skin covered by a uniform epidermis devoid of rete pegs and covered by a thin layer of keratin. The underlying corium is composed of dense collagen bundles with the exception of a narrow zone at the deep margin where the bundles are markedly swollen as in Case 1. Traversing the fibrous corium are numerous capillaries lined by hypertrophied endothelium. These vessels are mostly collapsed and can be traced into the subepidermal zone where they branch and ramify, forming congeries of closely packed vessels which stand out prominently. About them and scattered throughout the corium there is a large amount of haemosiderin. The sweat glands are atrophic. There are no hair follicles. Arteries and veins in the subcutaneous fat are patent and well preserved. Elastica is plentiful in the lower half but absent in the upper half of the corium. The skin in this case of long duration shows vascular changes similar to those in Case 1, but the haemosiderin pigmentation and fibrosis

is much more marked. The epidermis is atrophic. Collagen swelling is seen only as a narrow zone at the base of the corium.

CASE 3

A.J., female, aged 41 had dermatitis of the left ankle with superficial ulceration of four months' duration, with marked sclerosis of both legs so that the skin was no longer pliable, this being more marked in the left leg and involving the lower half of each leg. From June 12, 1947, 100 mgm. vitamin E complex was given daily, together with four injections of 200 mgm. intramuscularly once weekly for four weeks. The skin then became more pliable with healing of all the lesions. This patient was ambulatory throughout and carried on with her work.

CASE 4

J.F., male, aged 65 had a history of an old injury involving the left ankle with marked varicosities in

which he had had ulceration three years before. An indolent ulcer $1\frac{1}{2}'' \times 1\frac{1}{2}''$ was present over the outer aspect of the left malleolus. From September 18 to October 23 he received five injections of 200 mgm. vitamin E complex (tocopherol) weekly along with 150 mgm. daily by mouth. A moderate degree of sclerosis was present in the lower third of each leg. He showed complete healing of ulcers. He was ambulatory throughout.

CASE 5

G.W., male, aged 72 was admitted to hospital on July 7 and discharged on October 9. There was a large ulcer of the right lower leg, 4" in diameter, of $2\frac{1}{2}$ years' duration. Previous surgical care had been ineffective. There was restriction of movement of the right ankle along with marked thickening and sclerosis of the skin which was hidebound to a marked degree. A radiograph showed "calcification in the vessels of both legs and sub periosteal new bone formation involving the

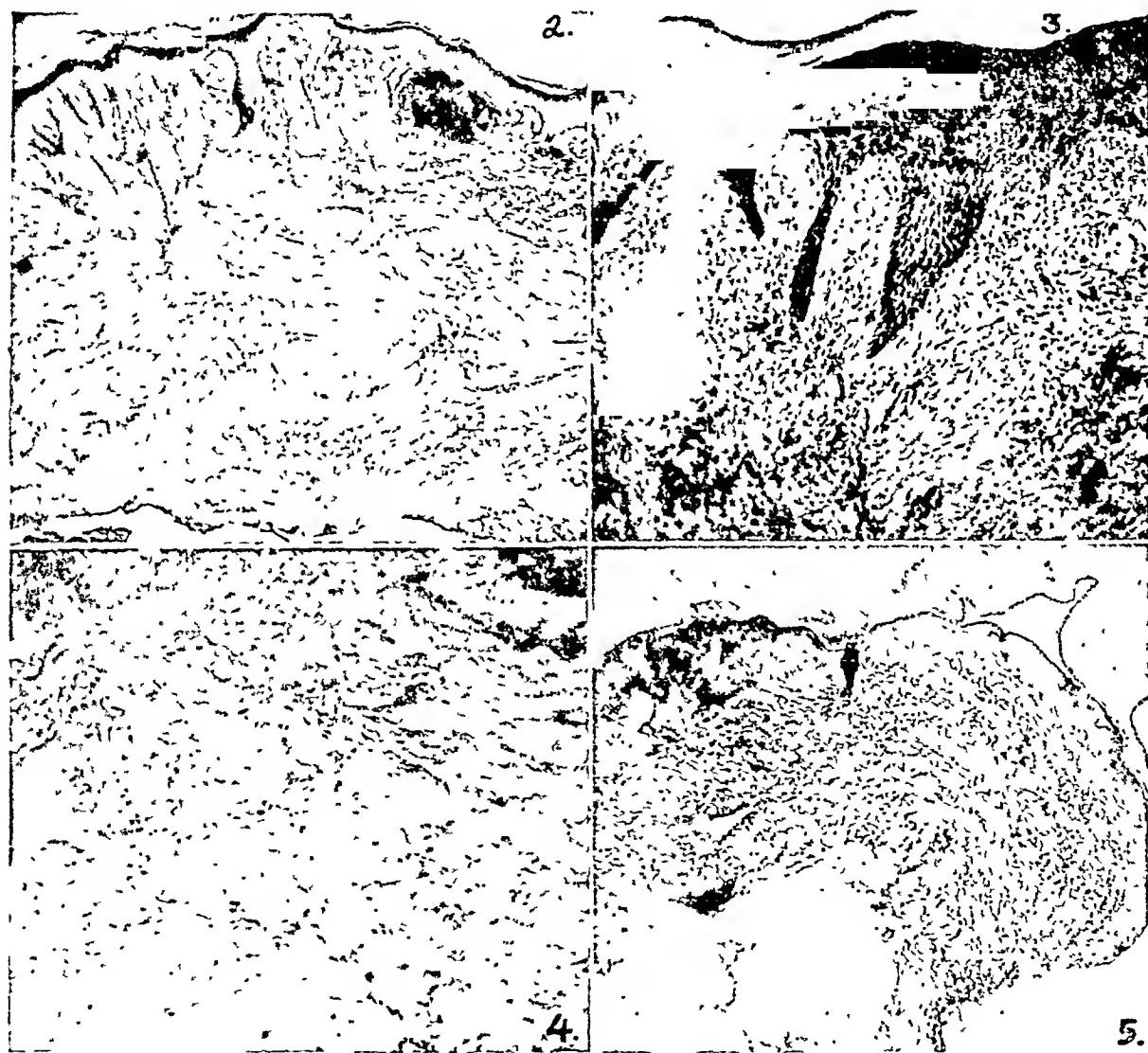


Fig. 2. (Case 1).—Low power of full thickness of section showing the marked sclerosis and thickening of the corium with prominent vascular markings, particularly in the upper part, and the irregular acanthosis and hyperkeratosis. Fig. 3. (Case 1).—Higher power of epidermis and zona papillaris showing acanthosis and the marked vascular proliferation with ectasia, lymphocytic infiltration and fixed tissue cell proliferation. Fig. 4. (Case 1).—High power through upper reticularis. Above is some well-preserved collagen. In the lower part the collagen is markedly swollen. Fig. 5. (Case 1. After treatment).—Same magnification as Fig. 2. The epidermis is normal. The zona papillaris and the reticularis appear about normal except for slight collagen swelling near the base. There is only mild perivasculär lymphocytic infiltration. Vascular markings are no longer prominent.

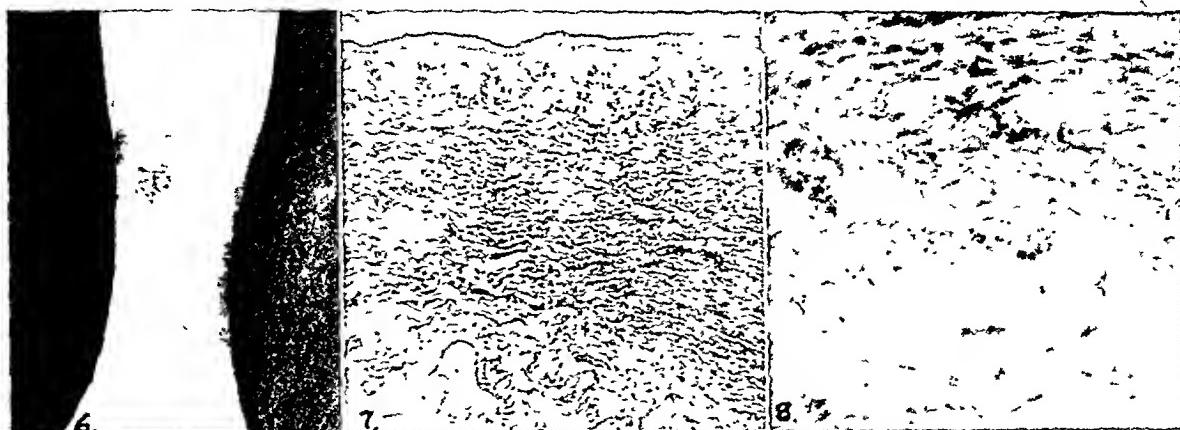


Fig. 6. (Case 2).—Biopsy ulcer, three weeks after operation (outer aspect of left leg).
 Fig. 7. (Case 2).—Low power full thickness of section. Epidermis is flattened; the zona papillaris is widened and in it are many congeries of capillary vessels with surrounding lymphocytic infiltration; the reticularis is mostly densely fibrosed and heavily pigmented with haemosiderin. Swollen collagen and a large venule can be seen at lower margin.
 Fig. 8. (Case 2).—High power at lower margin of Fig. 8 showing swollen collagen bundles below and fibrosed reticularis above.

posterior surface of the lower end of the tibia. There was evidence of a periostitis of long-standing and thickening of the soft tissues at this level, with obliteration of the fat space beneath the tendo Achilles."

The one and only biopsy was taken on July 8 through the margin of the ulcer in lower leg. Sections consist of skin without underlying fat. The whole is considerably thickened but only part of skin is included. On the surface are a few adherent shreds of keratin. The zona granulosa layer is two to three cells thick. Over the papillæ the epidermis is only four or five cells thick. The rete pegs are greatly elongated and many are bulbous at their lower ends. The papillæ are correspondingly elongated and expanded at their upper ends, edematous and contain many somewhat dilated capillaries lined by hypertrophied endothelium. There is a considerable diffuse infiltration with lymphocytes. The subepithelial zone shows a more marked lymphocytic infiltration and there are many dilated capillaries set at right angles to the surface. Throughout the whole zona papillaris there is a good deal of haemosiderin pigment in phagocytes. Beneath the zona papillaris there is a broad zone of actively proliferating fibrous tissue permeated by capillary type of blood vessels about which there is marked lymphocytic infiltration.

Vitamin E complex (tocopherol) 200 mgm. by mouth daily and 100 mgm. intramuscularly was administered every three days, no other local or other treatment being given. He improved slowly until his discharge from hospital when the ulcer was nearly healed. The ulcer broke down to a moderate degree one month later. Within another month the ulcer had increased in extent and while there was some increased pliability, the effects of treatment were fair only. On re-admission for further treatment the ulcer was much shallower and much less extensive than in his previous admission.

CASE 6

L.D., female, aged 64 had had multiple ulcers of the right ankle of eight months' duration. There was palpable sclerosis of both legs, more marked in the right leg. There was a history of repeated attack of phlebitis in both legs. Under tocopherol therapy, consisting of 150 mgm. tocopherol daily by mouth and 200 mgm. weekly vitamin E complex intramuscularly, for a month, while ambulatory, she improved considerably in that one ulcer healed. She was then admitted to hospital where under increased tocopherol therapy she responded well. Within one month all ulcers healed with scar formation and a palpable increase of elasticity of the skin.

CASE 7

Mrs. P., aged 55, was admitted to hospital on August 19, on account of an acute painful ulcer of the lower right leg. In 1928 there was an ulcer which followed an insect bite in the left leg. Over the past nineteen years there had been recurrent ulceration about every two years for which she has had a great deal of treatment. On admission, a large ulcer was present above the left inner malleolus. The skin surrounding the ulcer showed marked thickening and sclerosis. Cultures showed moderate growth of *Staph. pyogenes* and *P. vulgaris*. Under local compresses and vitamin E complex 200 mgm. intramuscularly every third day, together with 150 mgm. by mouth, she gradually responded. She remained in hospital for two weeks and following this, while ambulatory, was given 200 mgm. tocopherol daily by mouth and 200 mgm. vitamin E complex intramuscularly twice weekly. In two months the ulceration had gone but there was still obviously marked sclerosis. She was then given 600 mgm. tocopherol daily and four weeks later she was very well with a moderate degree of sclerosis remaining. Following increased tocopherol therapy the skin had become much softer and more pliable.

The above cases listed in some detail are a cross section of 24 hitherto treated cases in many of whom pathological studies have been made.

COMMENT

Leg ulcers, multiple or single, with or without eczematization, occur commonly in the lower third of one or both legs and are not infrequently viewed as "stasis" or "varicose" ulcers, particularly if oedema is present. The above-listed group of cases seems to us to have a common pattern. The association of a more or less sclerotic condition of the legs, in some patients only moderately apparent through "feel", in others the skin being hidebound, resulting in limitation of ankle movements—with or without varicosities and these are often present to a minor degree—together with multiple or single

ulcers of long duration or of frequent recurrence, often callous in type, makes up the clinical picture.

It is our opinion that the primary and important phenomenon probably is a sub-clinical degeneration of the collagenous tissue resulting in an inability of the skin to withstand trauma of no moment to the normal individual. Rather impressive has been the frequency with which biopsy wounds, away from the ulcer, have resulted in an inability to approximate the wound immediately or the frequency with which the area often rapidly enlarged to reproduce an ulcer characteristic of that for which the patient sought treatment. Biopsies were made in most cases on tissue taken a distance away from any ulcerative process. After therapy had been completed, tissues for biopsy were taken close by the site of the earlier biopsy. However, it would seem—presuming that trauma is a precipitating factor of moment—that once infection is introduced in such ulcers this in turn may well further intensify the sclerosing process as the leg having the ulcerative process shows clinically the greater degree of thickening.

Experimental evidence in rats shows that a muscular dystrophy of the lower extremities results after a prolonged vitamin E-deficiency diet. It has been shown that the greatest concentrations of vitamin E occur in the heart, lungs and spleen.³ It seems probable that the muscles of the lower extremities also require large concentrations of vitamin E in order to maintain a relatively high metabolic activity. This may be of importance in the localization predominantly in these areas of sclerosis with ulcer.

The pathogenesis and development of the lesions in these scleroses with leg ulcers seems to be first a collagenous swelling in the corium accompanied by vascular proliferation and often dilatation commencing in the papillary zone and accompanied by lymphocytic infiltrations, diapedesis of red cells from the capillaries and deposition of haemosiderin pigment. Then there follows a secondary proliferative fibrosis in the corium and the epidermis becomes acanthotic and hyperkeratotic.

The primary collagenous changes are more marked and more extensive in lesions of short duration in the younger individuals, as case 1, whereas the secondary proliferative

fibrosis and the acanthosis and hyperkeratosis predominates in long-standing lesions in older people, e.g., case 2. This may explain why the response to therapy was more rapid in those cases showing lesser degrees of sclerosis. The very common association of excessive pigmentation in leg ulcers with sclerosis, together with the marked deposition of haemosiderin may well be indicative of vitamin E-deficiency, comparable to the observation of Mason⁴ in vitamin E-deficient rats.

Purposely, the cases treated in hospital were given intensive tocopherol therapy with a view to its evaluation and therefore we excluded in many cases the factor of rest, local dressings or other medication. Antibiotic therapy together with other medical or surgical measures combined with tocopherol therapy would seem to offer the possibility of more rapid cure. It should be noted here that all of these cases were treated simultaneously by the administration of tocopherols both by mouth and parenterally. It seems to us that either route of administration will probably give comparable results, depending on the amount absorbed. Tocopherols in natural oils produce some pain and reaction when given intramuscularly. It is our observation that bed patients have little discomfort but that ambulatory patients do sometimes complain of discomfort about the third or fourth day after injections. It is best given into the gluteus maximus about two or three inches from the crest of the ilium.

In a large number of cases (including other collagenous degenerations apart from those here presented) given intramuscular injections of tocopherols in oil, one case only has shown tumour-like infiltrations, at the site of injection in the muscles, which have persisted over a long period of time. Some cases have temporarily developed infiltrative lesions which have, however, gradually disappeared. In the rat, intramuscular injections of mixed tocopherols result constantly in such infiltrations from which practically 100% tocopherols has been recovered.⁵ It would be wise to discontinue such injections in humans where any permanence of infiltration presents itself. There is further an occasional patient who tolerates fat soluble vitamin E complex by mouth rather poorly, the effect being that of gastro-intestinal disturbances, headaches and marked lassitude. Such cases are very few in number and treatment has had to be discon-

tinued in these or reduced considerably in amount.

Vitamin E complex is of undoubted value in the treatment of sclerosis of the legs with associated leg ulcers. This effect is directed probably entirely towards the regeneration of collagenous tissue, as demonstrated both clinically and histopathologically. It has seemed probable to us that the tocopherols, in exerting this specific effect upon collagenous structure, may inhibit enzymes, such as hyaluronidase, within the cell body, but it is reasonable that this effect may well be linked up to its known anti-oxidant activity as in its "sparring" function on vitamin A or other synergists.³ That the mixed tocopherols have little bactericidal activity is shown by its failure, when applied locally, to control bacterial content in two cases of ulcers. Further, it is not yet possible to indicate whether these results are obtained from the concerted action of the individual tocopherols or whether alpha, gamma, delta or beta tocopherols individually have a specific function.

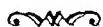
In moderate cases, a daily dosage of 100 to 300 mgm. of tocopherol by mouth is indicated, whereas in more marked cases a dosage of 600 mgm. of mixed tocopherols gives better results, preferably on an empty stomach and a relatively low fat diet. It would seem logical that a maintenance of tocopherol levels in the tissues is necessary in order to maintain its good health. Therefore it is suggested that vitamin E complex be continued in 50 to 100 mgm. doses daily over a period of time. This might be added to by the administration of non-defatted wheat germ by mouth or, if well tolerated, given without vitamin E complex.

We are indebted to Abbott Laboratories for generous and unlimited amounts of tocopherol or tocopherol with natopherol (contains large amounts of alpha tocopherol and lesser amounts of beta, gamma and delta tocopherols) in these studies.

We are indebted to Mr. Frank Zahalan for technical help and advice in this study.

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SPONTANEOUS PNEUMOTHORAX

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THE following 16 cases of spontaneous pneumothorax, observed in a two-year period at this hospital, are presented because this disease constitutes a relatively more common occurrence than might generally be expected. However, due to the fact that medical examination and treatment was easily available to certain service personnel, it might not be unexpected that some cases presented themselves at hospital who might, as ordinary civilians, have borne their complaints at home. This supposition seems more likely when one considers that, in 1943, of the total hospital admissions for the U.S. Army, 873 were for spontaneous pneumothorax.¹

In the minds of many, spontaneous pneumothorax has often been looked upon as occurring in patients suffering from pulmonary tuberculosis; this is being found to be by no means constant nor common. Coope² has drawn attention to the early observations of Galliard in 1888 and 1892, and by Kjaergaard in 1832, on the so-called "benign pneumothorax" occurring in apparently healthy young adults. He states that many patients who develop spontaneous pneumothorax neither have active tuberculosis of the lungs nor do they develop it later.

Spontaneous pneumothorax may be classified etiologically as follows: (1) Benign (simple or idiopathic) spontaneous pneumothorax—Coope's "pneumothorax of the scarred lung". (2) Pneumothorax due to rupture of an emphysematous bulla, occurring in generalized pulmonary emphysema. (3) Pneumothorax complicating active pulmonary tuberculosis. (4) Pneumothorax complicating other conditions including: congenital cyst, superficial pyemic abscess, traumatic laceration, ruptured oesophagus, malignancy, lung abscess, etc.

GROUP I. BENIGN SPONTANEOUS PNEUMOTHORAX

(Cases 1 to 10)

The largest group in this series consisted of cases of benign pneumothorax. There are various theories put forth as to why otherwise healthy persons should, more or less suddenly, develop a pneumothorax. Coope² postulates that in the majority of cases it is due to rupture of a small sub-pleural bulla or "bleb". The formation of these small bullae is subsequent

to the rupture or splitting of the subserous tissues in a region of scarred and fibrotic lung. The fibrosis may be due to some previous infection such as bronchopneumonia; this may have occurred in early childhood as a complication of measles or whooping cough; or the patient may have had some vaguely recollected "pneumonia", "pleurisy", or other chest illness. Other less common occurrences of this minor lung damage and fibrosis are in association with bronchial asthma, bronchiectasis, or silicosis; it may also follow upon poison gassing.

Leach,³ who reported 129 cases of pneumothorax in young adult males mentions as possible causes: spontaneous rupture of a weakened portion of pleura, tearing of a pleural adhesion, rupture of subpleural emphysematous blebs, interstitial emphysema leading to a subpleural collection and rupture, wearing through of pleura by a natural process of denudation.

Of our 16 cases 10 were classified benign spontaneous pneumothorax. When one considers other figures this seems to be a high number of cases for an average hospital practice. Niehans,¹ who reported 24 cases collected over a 24-year period, also reviewed the incidence in previous literature. Kjaergaard reported 51 cases seen in a 20-year period in Denmark; Perry, in London, reported 85 cases occurring in 14 years; Blackford saw 15 cases at the University of Virginia, 11 of which were in 5 years; Wilson, at Yale, had 11 cases in 5 years; and Overstern and Lereher reported 58 cases seen in a 20-year period.

The age of the patients in this group varied from 20 to 33 years, with an average of 24.5 years. This corresponds to Leach's³ series of cases from American Army Air Force personnel in which the ages varied 18 to 41 years with an average of 24.8 years.

History.—Two cases (8 and 9) gave a history of antecedent chest illness: Case 8 had "pleurisy" on the affected side about 3 years previously but was not x-rayed at that time. Case 9 had pneumonia "as a child". Six cases (1, 2, 4, 6, 8 and 10) gave a history of measles in childhood, but none of these had any knowledge of chest complications at that time. Two cases (4 and 6) had a known exposure to pulmonary tuberculosis 10 and 11 years previous to their present illness but neither had ever been known to have either a primary or re-infection.

In 7 cases the onset was characterized by a sudden pain in the chest: related to exertion (increased intra-pulmonary pressure) in 2 cases only, present on awaking (?yawning) in 3 cases, and produced by no apparent cause in 2 cases. In the 3 remaining cases the onset of pain was described as gradual over a period of 1 to 4 days and one case complained of pain for about a month before he presented himself at hospital. In two cases the pain was located in the epigastrum or lower substernal region. In another three cases there was radiation into the neck and/or arms. Most cases had dyspnoea on exertion or when lying on the affected side.

Examination.—Five cases had a pneumothorax on the left side and 5 had the right lung collapsed. Other statistics show a slightly higher percentage of collapses on the right side.^{3, 4} There were no bilateral pneumothoraces in this series. The degree of collapse varied from a small pneumothorax, scarcely discernible by x-ray, to almost complete collapse of all lobes. One case developed an effusion demonstrated by x-ray and this was absorbed in a week. Time required for re-expansion of the lung varied from 1 to 7 weeks. Generally speaking, the time required for complete re-expansion was greatest in those cases with the greatest collapse. None of these cases showed any radiological evidence of other significant lung disease. Eight of the 10 cases had a positive reaction to 0.01 mgm. O.T. (intradermal). White blood count and sedimentation rate was within normal limits (2 cases did not have complete blood work done). Seven cases had sputum or gastric washings examined for acid-fast bacilli; all of these were reported negative.

Progress.—The average period of hospitalization was 29.9 days and the indication for allowing the patients up was complete re-expansion of the affected lung. These cases have been re-examined and x-rayed over a period of 9 to 19 months and none have thus far shown any evidence of further chest disease.

GROUP II. PNEUMOTHORAX DUE TO RUPTURE OF EMPHYSEMATOUS BULLA

There were 3 cases (11, 12, 13) in which rupture of an emphysematous bulla was thought to be the cause of pneumothorax. Age 49 to 61 years. Average 54.6 years.

History.—Two cases (11 and 13) were admitted to hospital with a tentative diagnosis of coronary occlusion. One case (11) had the onset of the attack featured by pain in the left chest under the nipple, but it later spread to the right chest, shoulder and arm. He was markedly dyspneic and apprehensive. Chest x-ray revealed a 50% collapse of the right lung; there was complete re-expansion in 3 weeks. He had 2 recurrent spontaneous pneumothoraces on the same side during the next 5 months. Electrocardiogram tracings did not show any changes indicative of myocardial infarction. The second case suspected of having a coronary occlusion had had a similar attack 10 years previously but was not x-rayed. His cardiogram showed no specific changes. His chest x-ray showed a diffuse fine fibrosis, the cause of which was not specifically demonstrated, and 25% collapse of the left lung. There were large emphysematous bullæ at both apices.

The third case had no chest symptoms, possibly due to the fact that he was at bed rest during the treatment of advanced rheumatoid arthritis and spondylitis. A routine chest x-ray showed a 20% collapse of the right upper lung with emphysematous bullæ at the apices. A review of his chest x-rays for the past 5 years showed 2 previous pneumothoraces both apparently asymptomatic. Schneider and Reissman⁴ in a series of 100 cases of pneumothorax discovered on x-ray examination of army inductees found that 5% were asymptomatic.

Progress.—One patient, who suffered recurrent attacks, which in the presence of a very low pulmonary reserve constituted a considerable danger, was eventually given an artificial plenitude (using 5 minimis of 10% silver nitrate) which has apparently prevented any further attacks. Two of these cases are not employable, one due to marked pulmonary emphysema, and one due to arthritis. The remaining case is employed at light work.

GROUP III. COMPLICATION OF PULMONARY TUBERCULOSIS (Cases 14 and 15)

History.—Both these cases (ages 59 and 61) had long histories of bilateral pulmonary tuberculosis, with positive sputum. The first case (14) developed a left spontaneous pneumothorax as a postoperative complication follow-

ing the removal of a tuberculous kidney. Chest x-ray showed a 50% collapse of the left lung. He subsequently developed a small pleural effusion, which did not reveal any acid-fast bacilli on culture; the effusion was absorbed in 4 to 5 weeks. The lung completely re-expanded in 3 months. This patient eventually died in hospital and post-mortem examination revealed far advanced pulmonary tuberculosis with cavitation of the left lung, and tuberculous enteritis (as well as a tuberculous kidney, previously removed, and cystitis).

The second case (15) was admitted with severe respiratory distress and was found to have a hydro-pneumothorax on the right side. The air was apparently absorbed in 1 week, but the effusion persisted for 5 to 6 months. Examination of this fluid did not reveal any acid-fast bacilli on culture. This case was thought to have pulmonary emphysema secondary to long-standing tuberculosis and the pneumothorax may, in fact, have been due to the rupture of a bulla, rather than the breakthrough of a tuberculous lesion.

GROUP IV. OTHER CAUSES

(1 case [16], aged 39)

History.—At a routine preoperative examination while patient was serving in the army, this man complained of some dyspnea which had gradually developed over a 2-month period, accompanied by some right chest pain. He was found to have a hydro-pneumothorax on the right side. He was treated conservatively over a 20-month period and was aspirated several times, with the eventual re-development of hydro-thorax or hydro-pneumothorax. Pleural fluid, sputum and gastric washings were negative on examination for acid-fast and other pathogenic organisms. He was finally submitted to exploratory thoracotomy, at which a broncho-pleural fistula was found in the lower anterior portion of the right upper lobe. This segment of lung was resected and there has been no recurrence of the trouble a year later. (Possibly this patient had a benign spontaneous pneumothorax initially with a persistent broncho-pleural fistula).

SUMMARY

1. Sixteen cases of spontaneous pneumothorax are reported. It is thought that due to the nature of the institution and medical services more cases are discovered than might be diag-

Kobylinski¹ (1883) was the first to describe webbing of the skin on the lateral aspects of the neck and suggested its possible relationship to congenital short neck. Sutton² placed web-like expansions in general among the instances of spurious atavism. He regarded them as spontaneous variations or "sports". The term "pterygium colli" was first applied by Funke³ in 1902 to this anomaly seen in a 15 year old girl. It was associated with abnormalities of the breast and nipples and with the absence of pubic and axillary hair. In the same year Bussière⁴ reported webbing of the neck in a Hindu boy aged 12 years. Ballantyne⁵ thought that the web-like structures found passing between various parts of the body might be of the same nature as feto-fetal bands or amniotic adhesions. These expansions, to which the name patagium might be applied, sometimes passed from the neck to the shoulder on one or both sides. He felt that, while the patagium might not be amniotic in origin, it was sometimes found associated with malformations which were generally regarded as such.

In 1912 Klippel and Feil⁶ described another syndrome which consisted of synostosis of some or all of the cervical vertebrae associated with cervical spina bifida and in which a shortened hair-line and limitation of movement produced an appearance not unlike that of pterygium colli. Hutchinson⁷ actually demonstrated the first specimen of this in 1894 and Clarke⁸ the first clinical case in 1906.

A case was reported by Drachter⁹ in 1923 in which webbed neck ("dove neck") was found. The presence of a suboccipital encephalocele, however, suggested a diagnosis of Klippel-Feil syndrome rather than pterygium colli. Frawley¹⁰ reported webbed neck in two sisters 12 and 16 years of age, in a woman of 28 and in a girl of 7 in whom there was also webbing of the axillary folds. X-ray examination was negative.

Sections of the folds of the neck obtained at autopsy were studied by De Bruijn¹¹. They revealed muscle and suggested an abnormal distribution of the platysma myoides. The deep fascia and muscles were not involved. Ullrich¹² stressed the combination of multiple abnormalities. Nageotte-Wilbouchewitz¹³ believed the condition to be one of pure atavism and remarked that it occurred naturally in the chimpanzee. One case associated with elephantiasis was reported from Helsinki by Rantasalo.¹⁴ This was

a female infant with a thick fold of skin from the mastoid process to the acromial process on both sides. One arm was slightly thickened and both legs and feet were markedly and symmetrically thickened. He stated that pterygium colli was rare and belonged to the same class as folds of the axilla, elbow, fingers and knees. Elephantiasis congenita lymphangiectoides was also very unusual. Only two cases have been reported in which the two conditions occurred in the same individual. He also discussed mongolism in this connection. Hoffman¹⁵ in 1937 reported three cases and also stressed the combination with other malformations. He felt that it bore some relationship to mongolian idiocy and to the Klippel-Feil syndrome. Two more cases were added by Chandler¹⁶ and he referred to the differential diagnosis from Klippel-Feil syndrome and also from Sprengel's deformity. He discussed the surgical correction by means of plastic procedures especially those of the "Z"-plasty type and described in detail his modification of the latter. Marquardt¹⁷ described one case of folds involving the legs and two cases involving the neck. Until now these had been treated according to the principles of plastic surgery. He thought, however, that this could usually be avoided by bloodless orthopaedic measures.

Turner¹⁸ in 1938 described a syndrome consisting of the triad, infantilism, webbing of the skin of the neck and deformity of the elbow (cubitus valgus). He reported seven female patients all of whom presented osseous and sexual retardation similar to that associated with hypothyroidism or the Lorain-Levi type of dwarfism with retardation in growth and sexual development. The cervical vertebrae were normal but the neck appeared short because of the webbing and the low hair-line posteriorly. He specifically mentioned that mental retardation and other abnormalities were not present. Treatment with pituitary growth hormones was unsatisfactory. Definite genital development followed administration of anterior pituitary-gonadotrophic hormone in two cases.

By 1938 MaeCollum¹⁹ found that approximately 20 patients had been described. He approached the problem from the standpoint of embryology. During the early weeks of fetal life the neck was difficult to distinguish from either the head or shoulders as the diameters of all three structures were very nearly the same.

As the branchial arches grew ventrally to form the lower face and anterior portion of the neck and as the limb buds began to develop the neck became a definitely recognizable structure. Its actual length, however, was almost negligible as the cervical flexure of the fetus placed the chin against the thorax and that portion of the head which would become the mastoid process remained almost continuous with the shoulders. As the fetus continued to develop the head grew more rapidly than the rest of the body so that in the 2nd or 3rd month of pregnancy it had become over one-quarter or one-third wider than the shoulder girdle. Observations made at this period revealed that the neck was quite long on its dorsal surface because of the cervical flexure. It was found to be even longer on the ventral surface because of the medial ingrowing of the branchial arches. It is to be particularly noted that there was very little length to the neck on both its lateral surfaces and that the region of the mastoid process was likely to be either lateral to or in direct vertical line with the region of the acromial process. If, at this time, there was a failure of normal development it was possible for the skin over the lateral surfaces of the neck to remain shortened. As the body grew and the shoulders assumed their normal width, the skin would be even more deficient so that tight bands or webs would form between the acromion and mastoid, the two points which were so closely approximated in early fetal life. He studied four cases and several fetuses and advised the "Z"-type plasty but enumerated several precautions.

Bizzarro²⁶ felt that there was a definite relationship between the congenital high scapula (Sprengel³ 1891) and congenital short neck (Klippel and Feil¹¹ 1912). In both conditions there may be absence of the vertebrae or anomalies in their number or malformed or anomalous ribs. Brevicollis, it seems, is an advanced stage of high scapula. In both conditions the descent of the shoulder girdle is incomplete. Further, bilateral high scapula may show a lowered scalp hair-line and therefore a relatively short neck; it also displays a webbed wing-like neck as in brevicollis. The limitation of the facial expression among frog-necked people may be the result of endocrine dysfunction for in some the expression is quite cretinoid. He reported the case of a

boy aged 14 years. The main features were the expressionless mongoloid face, the lowered nape line, the high level of the scapulae and the short neck. Radiograms showed the cervical vertebrae normal in number and shape except for the slight euneiform appearance of the third. He had bilateral undescended testes and no pubic hair but no changes in the elbows. He was given gonadotropin, pituitrin and thyroid extract without improvement. It was suggested that later a plastic operation (after Gillies) might improve the contour of the neck. Bizzarro felt that this case was a link between two separate conditions. Clinically it could be classified either as an elementary form of Klippel-Feil syndrome or an elaborate form of congenital high scapula. I feel that this case is even more interesting. The diagnosis of Klippel-Feil syndrome rests only on the shape of the third cervical vertebra. I submit that the diagnosis of pterygium colli with high scapula should be entertained. In addition, this patient showed evidence of infantilism and only lacked cubitus valgus to be considered an example of Turner's syndrome. This case exemplifies the merging of some features of four clinical entities.

Sharpey-Schafer and Sehrire^{23, 24} reported that urinary creatinine excretion in a case of Turner's triad was normal. They injected pituitary thyrotropic extract and caused a rise in temperature and pulse rate on the sixth day. The thyroid became enlarged and tender and the basal metabolic rate rose to 43%. Sharpey-Schafer²⁵ treated with testosterone propionate a similar patient who had had hot flushes for four years. Three doses of 50 mgm. each stopped the flushes. The dose was raised to 100 mgm. daily and the flushes remained absent. Sylvert²² described one case of pterygium colli in a boy of 16 years who also presented an abnormality of the patella and Thiemaun-Fleischner's disease of the proximal epiphyses of the second phalanx of both middle fingers. In 1940 Capurra²³ reported the first case of Turner's syndrome in South America. Hauptman and Thannhauser²⁵ described an entirely different heredo-familial entity in which the "webbed neck" was produced by tension of the shortened trapezius.

Gilmour²⁶ advanced the hypothesis that the Klippel-Feil syndrome is merely a mild form of the deformity characteristic of myelomeningocele.

the middle third with marked displacement, in which reduction cannot be maintained. (2) Fractures of the outer third which present the same problem as acromio-clavicular dislocations. (3) Any fracture in which a perfect cosmetic result is particularly desired. (4) Cases in which immobilization of the arm would impose a severe economic handicap.

Many methods of fixation have been suggested. Plating is difficult because of the size and shape of the bone and its subcutaneous position. Intramedullary wire fixation was first advocated by Murray in 1940. He recommended a closed reduction and the wire was introduced into the medullary cavity at the lateral end of the bone and made to traverse the fracture line blindly. This method has yielded excellent results in a large series of cases, but it is not without danger and in comminuted fractures reduction may be difficult. Murray also suggested an alternative procedure in which the fracture was exposed and the wire driven outward along the medullary cavity of the lateral fragment and then reversed and drilled back into the medial fragment. This method was suggested to the writer by Dr. L. H. McKim who had used it in several cases. It has proved to be so simple and free from complications that it was adopted as a routine. The present technique has been used in 11 cases with satisfactory results in all.

TECHNIQUE

The patient is placed on his back with a sand-bag beneath the scapulae so as to raise the posterior aspect of the affected shoulder above the table. Light nitrous oxide, cyclopropane or pentothal anaesthesia may be used. The procedure only takes 15 minutes and no great relaxation is necessary.

A one inch incision is made over the site of the fracture. It is placed low to avoid adherence of the skin to the subcutaneous surface of the bone. The platysma is divided and the fracture exposed. After cleaning out blood clot and any soft tissues between the bone ends, the lateral fragment is lifted out of the wound and held firmly in bone-holding forceps. A large Kirschner wire is then introduced into the medullary cavity of the lateral fragment and drilled along the canal until the point of the wire emerges through the skin at the

postero-lateral aspect of the shoulder. There are no important structures which may be injured by this maneuver. The protruding wire is then grasped and withdrawn through the skin until the medial end lies flush with the fracture line. The two fragments are then accurately aligned in position and held. The drill is attached to the projecting lateral end of the wire and it is driven back so as to enter the medullary cavity of the medial fragment traversing the fracture line. The wire is driven into the medial fragment for a distance of 2 inches which is sufficient to fix the fracture firmly but which does not endanger any vessels. The lateral end of the wire is then cut off and allowed to lie subcutaneously. The wound is closed by suturing platysma and skin with fine silk.

Postoperatively a sling is worn for 48 hours and then full movement is allowed. Sutures are removed in seven days and in 4 weeks the wire is withdrawn. This may be done by infiltrating some local anaesthetic over the palpable lateral end and grasping it with a haemostat through a tiny nick in the skin. The wire may then be withdrawn without pain or difficulty.

This method has been used in 11 cases with no complications and satisfactory results in all. Patients are hospitalized for 48 hours and at discharge no sling or other form of immobilization is required. All cases have returned to work within 72 hrs. after the accident and have been able to dress, shave, brush their hair and look after themselves without discomfort. Strenuous physical exertion has been discouraged, but in one case the patient was trapped in a burning house one week after operation and was able to descend two stories on a ladder without pain and with no ill effect on the position of the fracture. Several patients have been quite pleased with their personal comfort compared to others they have seen "trussed up like turkeys" with adhesive bandages.

The scars have been inconspicuous and if placed low, no adherence to the bone occurs. There has been one minor infection which quickly cleared up with penicillin and did not delay union. This occurred about the projecting end of the wire before the routine of leaving the end subcutaneously was adopted. Since that time patients have been given penicillin

for 48 hrs. postoperatively and no further infections have been noted.

The following are representative cases.

CASE 1

F.S., female aged 26, admitted to the Royal Victoria Hospital March 2, 1947. She had fallen downstairs 2 hours before admission and sustained a transverse fracture through the middle third of the left clavicle. Immobilization with a figure of eight bandage was tried but satisfactory position could not be obtained and on March 5, open reduction and wiring was done under cyclopropane anesthesia. Postoperative x-rays showed satisfactory position and the patient was discharged 48 hrs. postoperatively. She returned to her work as a typist the day after leaving hospital. One week after operation her home caught fire and she was obliged to descend two stories by ladder. This caused no discomfort and no ill effects. The wire was removed 4 weeks after insertion and patient had excellent union clinically and by x-ray.

CASE 2

H.A., male aged 28, admitted to Royal Victoria Hospital, February 15, 1947. This patient had sustained

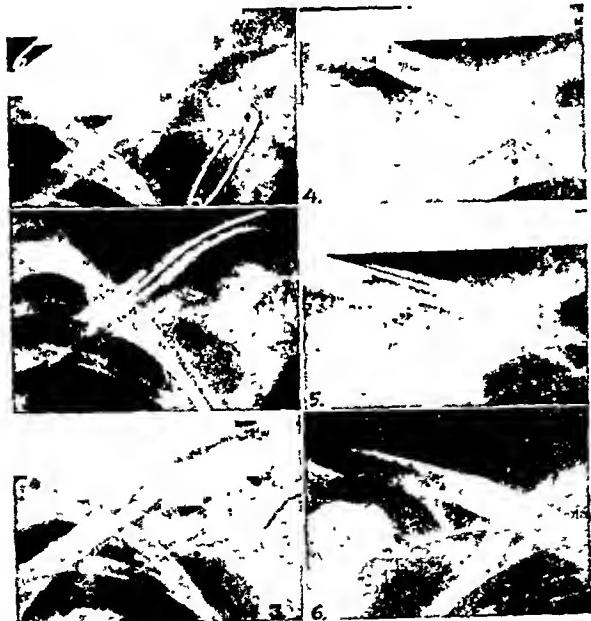


Fig. 1. (Case 1).—Before wiring. Fig. 2. (Case 1).—After wiring. Fig. 3. (Case 1).—End result. Fig. 4. (Case 2).—Before wiring. Fig. 5. (Case 2).—After wiring. Fig. 6. (Case 2).—End result.

an oblique fracture of the middle third of the left clavicle while skiing about 3 hours before admission. Under cyclopropane anesthesia open reduction and wiring was done on the day of admission. Because of the obliquity of the fracture line an encircling wire was also used. Post-operative course was uneventful. Patient was discharged February 18, 1947 and returned to his studies at the University. The wire was removed 3 weeks later and there was good union clinically and radiologically.

SUMMARY

1. A technique of wiring fractures of the clavicle is described.
2. This method has been used in 11 cases with satisfactory results and no major complications.

3. It is fully realized that open reduction and internal fixation of clavicular fractures should only be used in special cases and under ideal circumstances where meticulous aseptic technique can be maintained.

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THE BIOLOGY OF METABOLIC DISEASE IN MAN*

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LOUIS GROSS was interested in a variety of specific subjects ranging from anatomy to therapeutics, from cellular morphology to psychoanalysis. The diversifications of his interest were not the vagaries of a dilettante but rather the heroic struggles of one seeking to encompass the mechanisms responsible for what Mumford so aptly called "The Condition of Man".¹ Even in his earliest studies, Gross sought not merely to describe precisely the vascular supply of various organs, but also to demonstrate that the status of man and his individual organs varies with each age-period as the result of a balance between internal and external forces. His studies of morphologic variation and distortion were utilized merely as a technique to clarify those biologic processes by which the total organism is synthesized and maintained. Implicit in his conclusions was the realization that every response of the individual—morphologic, physiologic or psychologic—represents the effort of the individual to adapt himself to the vicissitudes of his environment in order to continue with the process of growth and survival.

Claude Bernard first clearly recognized the organism's continuous effort to maintain a constant internal environment and described some of the physiologic mechanisms which serve to maintain the constituents of the body fluids at fairly fixed levels.² These studies were further expanded by Cannon's description of the self-regulating processes of individual tissues and

* The Tenth Louis Gross Memorial Lecture, delivered at the Jewish General Hospital, October, 1947.

thyrotropic factor. The exact rôle of the thyroid in the metabolic cycle is somewhat ambiguous. It is essential for the absorption of carbohydrates, the maintenance of the general metabolic level and, at certain stages of development, for growth. Nevertheless, the administration of excessive amounts of thyroid extracts not only fails to stimulate growth but rather accelerates the total catabolism by inducing an increased glycogenolysis and an increased rate of carbohydrates, protein and fat utilization. When the pancreatic reserves have been rendered inadequate by partial pancreatectomy, the administration of thyroid extracts can induce the development of diabetes. However, in the already diabetic animal, it will always cause an exacerbation of the disease.

It appears probable that the most important rôle of all of the hormones is to ensure the responsiveness of the cellular mechanisms to a variety of stimuli. This may be exemplified by the observation that doses of stilboestrol will produce hyperglycæmia in the intact animal but will not do so in the absence of that amount of adrenal hormone which is necessary for the maintenance of the animal.

The precise site at which the endocrine agents act is unknown. Cori's *in vitro* observation¹³ that extracts of the anterior pituitary and the adrenal can inhibit the hexokinase reaction and that insulin reverses this inhibition has been confirmed by us but we could get no evidence that this is a physiologic phenomenon.¹⁴ At the present time it appears safe to say only that as a result of the action of the hormones on the intracellular systems, a dynamic balance is maintained, for example, between the influence of insulin favouring essentially the anabolic process and that of the hormones of the anterior pituitary and its target glands essentially favouring catabolism. During the lifetime of man, a shift in this balance determines whether growth or senescence will prevail.

Of great significance in any consideration of physiologic integrations are the studies of Selye which culminated in his description of the "Adaptation Syndrome". His studies indicate that the organism responds to a great variety of stresses with physiological changes which are essentially dependent upon the integrity of the adrenal cortex and that excessive activity of the gland is responsible for the diseases of adaptation. It is impossible at this time to discuss this

concept other than to draw attention to a direct outgrowth of these studies.

Recently, Long and his associates¹⁵ have demonstrated that all circumstances which produce an increase in the secretion of the adrenal cortex can do so only through a preliminary activation of the anterior lobe of the pituitary and that one of the most potent factors producing this activation is the epinephrine released by stimulation of the adrenal medulla. It is probable that a similar activation induces the secretion of the other trophic hormones of the anterior pituitary.^{16, 17} Since epinephrine secretion is dependent upon stimulation of the autonomic nervous system, it can serve as the link between humoral and nervous regulation.

NERVOUS REGULATION

Many attempts to evaluate the function of the nervous system in the regulation of carbohydrate metabolism followed upon Claude Bernard's demonstration that puncture of the fourth ventricle produces hyperglycæmia.¹⁸ Zunz and LaBarre's report that the secretion of insulin is stimulated by higher centres acting through the vagi¹⁹ and Cannon's observation that emotional excitation results in glycosuria³ gave further impetus to such studies. Yet, a critical evaluation of the more recent experimental evidence suggests that the central nervous system does not play a significant rôle in the direct regulation of carbohydrate metabolism. It may do so indirectly through its regulation of the secretion of some glands, the regulation of circulation and thereby of the rates at which foodstuffs are brought to the cell and finally through its effect on the organism as an integrated whole.

It is a fact that impulses originating in the hypothalamus activate the sympathetic nervous system and thereby stimulate the secretion of epinephrine with a consequent increase in hepatic glycogenolysis and hyperglycæmia. However, prolonged electrical stimulation of the sympathetics or even a continuous intravenous injection of epinephrine results in a temporary rise only in the blood sugar level. This effect of sympathetic activity is not associated with an increase in fat and protein catabolism but seems to be dependent upon the presence of glycogen and therefore is quite different from the profound derangements observed in diabetes mellitus. It can be concluded only that this end result of hypothalamic activity represents the

effort of the organism as a whole to alter temporarily its cellular metabolic activity in order that it might adapt itself to a rapidly changing environment.

In accord with Long's observations, it would appear that hypothalamic excitation induces a chain reaction consisting of stimulation of the sympathetics, stimulation of epinephrine secretion, stimulation of the secretion of the trophic hormones of the anterior pituitary and finally, stimulation of the secretion of the hormones of the thyroid and adrenal cortex. If this be true, the end result of hypothalamic stimulation represents the direct effects of the adrenocortical and thyroid hormones on cellular metabolism. This hypothesis gains support from Bodo's demonstration that the hyperglycæmic effect of epinephrine is greatly diminished in the hypophysectomized animal.²⁰ Further, the need for such a chain reaction would account also for the fact that the sympathectomized animal fails to respond adaptively to various stressful situations.³ However, since hypothalamic or sympathetic excitation does not produce an increase in fat and protein catabolism, as would be expected from an increase in circulating corticosteroids, doubts exist as to whether this representation of the mechanism of autonomic activity is a valid one or whether it fails to include some yet unknown links.

In regard to the parasympathetic system, the best evidence indicates that vagal stimulation produces insignificant changes in the blood sugar level. In fact, recent knowledge suggests that the hypoglycæmia induced by insulin stimulates the parasympathetic centres rather than the reverse; a fact which is utilized clinically to determine the functional results of vagotomy in the treatment of peptic ulcer.

It is important to appreciate that not only may the nervous system affect the rate of secretion of the endocrine glands but that humoral agents can influence the activity of the central nervous system. Thus, an increase in the concentration of circulating thyroxin will stimulate the activity of the autonomic nervous system, as will also an increase in the oestrogens. Of interest in this connection is the demonstration by Benedek and Rubinstein that the concentration of oestrogens in the circulation exerts a profound psychological influence on the human female in that aggressive tendencies are associated with the high oestrogen phase of the menstrual cycle,

whereas more infantile, dependent tendencies occur during the low oestrogen phase.²¹

Like an increased activity, so also a diminution in the activity of the autonomic nervous system is often associated with profound peripheral effects. Thus sympathectomy increases the sensitivity of the peripheral tissue to epinephrine and other sympathicomimetic agents, whereas ablation of the parasympathetics increases the sensitivity to acetylcholine. The recent studies by Page and Taylor²² reveal that this is true also for humoral agents whose action is independent of the nervous system. They demonstrated that the progressive diminution of the pressor response that occurs in the intact animal on repeated intravenous injection of renin, i.e., tachyphylaxis, is prevented when the sympathetic ganglia are blocked through the use of tetraethyl-ammonium chloride. At the same time the sensitivity to epinephrine and antitoxin is increased. This indicates that in the presence of an intact sympathetic nervous system, some inhibitory influence is exerted on the responsiveness of intracellular enzyme systems to the action of the extracellular humoral agents.

DIABETES MELLITUS IN MAN

Even an incomplete outline of the various mechanisms involved in the regulation of carbohydrate metabolism indicates quite clearly that until more is known of the components of any system, little can be said of its total capacity and of its liability to fail under stress. Nevertheless, it is obvious that diabetes mellitus in man represents some disturbance in the integrated activity of the intracellular systems responsible for the utilization of carbohydrates irrespective of whether that disturbance originates in the cells themselves or is secondary to abnormalities in the action of the humoral or nervous factors which influence the cells.

It was quite natural that the discovery that pancreatectomy of the dog produces a permanent hyperglycæmia should have led to the assumption that spontaneous diabetes mellitus in man is due to a decreased production of insulin by the pancreas. This classical concept gained further support from the observations that all other forms of experimental permanent diabetes are also dependent upon the destruction of islet tissue.

Unfortunate as it may be for our composure, examination of the evidence suggests that dia-

betes mellitus in man cannot always be attributed to the same cause.²³ Post-mortem data demonstrate that only about 25% of the pancreas of human diabetics reveal sufficient damage of the islet tissue to account for the metabolic disorder. Further, in less than 5% have there been found the typical lesions of pancreatic exhaustion that occur in experimental diabetes in animals. Such pancreatic lesions as have been found in human diabetics are not uncommonly observed in elderly people dying without a history of diabetes, all of which suggests that such lesions may bear no causal relationship to the disease. More important still is the fact that when the entire pancreas in man is destroyed by disease or removed by operation, the pancreatic diabetes that results is relatively mild and neither approaches the severity of spontaneous diabetes mellitus nor requires the amounts of insulin so frequently needed to control the spontaneous disease. Nevertheless, the resemblance of the syndrome of the depancreatized dog or monkey to that of diabetes mellitus in man and the similar response to insulin in both animals and man suggest that in the majority of instances the human syndrome is undoubtedly due to an insulin insufficiency.

However, this insufficiency cannot always be attributed to an inadequacy of the pancreas to supply a normal amount of insulin. Rather, must it be assumed that the amount of insulin normally produced is relatively inadequate for the needs of the diabetic subject. A number of postulates may explain the inability of the "normal" amount of insulin to satisfy the needs of the particular patient. The excessive rate of metabolism of the foodstuffs consequent on an increased ingestion of food or an increased rate of utilization secondary to infection, thyroid disease or other factors may well require abnormally high amounts of insulin for metabolic balance; the insulin produced by the pancreas may be inactivated by circulating humoral antibodies; lastly, although insulin is destroyed in the body under normal conditions, under abnormal conditions the rate of its destruction in the tissues may become excessive so that a normally functioning pancreas can no longer maintain a satisfactory balance between insulin production and insulin destruction. It appears probable that it is an increased utilization or destruction that is responsible for the insulin insufficiency of most diabetics.

That there are factors capable of destroying insulin is indicated by preliminary studies in our laboratory which have revealed that extracts of rat liver, spleen, kidneys and muscle contain a non-proteolytic enzyme system which can inactivate added insulin. This enzyme system is comprised of a dialyzable heat-stable component and a non-dialyzable heat-labile substance, neither of which is effective alone. We also observed that human liver appears to be rich in its content of a similar insulin inactivator. The possible rôle of this system in the genesis of human diabetes must await further study.

Although the anterior pituitary and the adrenal cortex have a profound influence on the regulation of carbohydrate metabolism, there is but little evidence that they play more than a secondary rôle in the etiology of human diabetes. In the dog the permanent diabetes induced by the injections of extracts of the anterior pituitary is always associated with islet destruction, but in acromegaly the pancreas does not show the typical lesions observed in animals. Further, a sufficient number of cases with both diabetes and adrenal insufficiency and diabetes and Simmond's disease have now been reported to suggest that these glands cannot play a major rôle in most instances of human diabetes.

It is probable that in both hyperpituitarism and in hyperadrenocorticalism the concomitant diabetes is due either to an excessive destruction or neutralization of insulin or to an increase in the availability of substrates to an extent that overtaxes the capacity of the intracellular regulatory system, or in rarer instances, the capacity of the pancreas to produce insulin. The exacerbation of an existing diabetes produced by hyperthyroidism can be attributed to the increase in the peripheral utilization of carbohydrates and the consequent acceleration of the rate of gluconeogenesis and glycogenolysis.

The initiation or aggravation of human diabetes by infection can be attributed either to a direct disturbance in the integrated function of the intracellular enzyme systems or to an excessive utilization or destruction of insulin. In accord with this is the fact that the production of an infection increases the insulin requirements of the depancreatized dog.

From 50 to 70% of diabetic subjects present themselves with a history of obesity of variable duration and degree. However, the obesity itself is not the cause of the diabetes since only about

5% of obese patients develop diabetes. The fact that a good many obese non-diabetic subjects develop hypoglycaemia six hours after the ingestion of carbohydrate and that post-mortem examination of the pancreas from such subjects may show signs of increased activity suggests that some extrapancreatic factor has increased the demand for insulin. This may be due to a strain on the capacity to store fat, to an increase in the energy utilized in the constant breakdown and synthesis of the fat molecules in the depots, to a disturbance in humoral integrations consequent to the deposition of fat in glands and tissues, and so forth. In the obese individual with an adequate pancreatic capacity, the increased rate of insulin utilization or destruction is adequately compensated for by the pancreas. Only in those obese individuals in whom the rate of insulin destruction or utilization continues to be excessive and beyond the capacity of the pancreas or of the intracellular and extracellular regulatory mechanisms will a relative insulin insufficiency ensue. In some of such instances, mere reduction of the caloric intake and of body weight will ameliorate the diabetic state. The immediate cause of obesity is overeating, which usually is the result of some disturbance in the emotional development of the individual, so that he reacts to a frustration in the present by withdrawing to a behaviour which was more gratifying in the past. This can be traced to that time when the infant was dependent upon being fed by some other person in order to satisfy his physiologic requirement for food. The satisfaction of this requirement relieved the tension of hunger so that food, or being fed, became associated with a pleasurable sensation as it did also with other pleasurable sensations such as warmth, odours and the soothing aspects of the person who is providing the food. As a result of this experience, eating came to mean something which is inseparable from the relief of tension, affection and other pleasurable feelings; an association which is never completely abandoned but remains to some degree in all individuals.

If an infant has been overindulged with respect to food, or has been given excessive satisfaction in consequence of the parents' attitude toward food and its significance, he may become reluctant to relinquish this early phase of development for a more mature one. Thereafter, he automatically returns to it whenever he en-

counters a situation which is unpleasant, anxiety-producing or frustrating. In such an individual, the tension induced by the need for affection, for prestige or by loneliness may be relieved only by withdrawing to that infantile phase when eating was the satisfactory solution. On the other hand, if an infant's earliest tensions were not relieved adequately, i.e., if he were never entirely satisfied in his requirements for nourishment, he may never outgrow his insatiable need for food or for being given things and will persist in his attempt to receive that satiation of which he was deprived. Thereafter, such individuals may relieve their anger, envy, and the frustration of their desires by eating. Irrespective of the genetic background, it appears that overeating is the obese person's habitual response to the necessity for solving such difficulties as are encountered in adult life by everyone.

Inadequate as it may be, obesity is the resultant of an individual's attempt to adapt to the emotional stresses to which he is exposed. The cause of the overeating and the effect of the obesity are really two distinct phenomena, though it is a fact that the immaturity of the personality is the initial link in the causal chain which, in the individual with a limited physiologic capacity, ends in what we recognize as diabetes mellitus.

Obesity is only one of the many stressful situations which may result in diabetes in the susceptible subject. We have indicated already that infection, liver damage, endocrinopathies and a variety of other organic changes can so stress the organism as to cause failure of inadequate systems. However, with respect to the direct effects of psychic stress, there is still much doubt in spite of the evidence that such stresses can produce profound endocrine and enzymatic changes as may be exemplified by psychogenic amenorrhoea or the activity of serum proteinases under stressful situations.

That an emotional upheaval in the diabetic can result in an exacerbation of the severity of his metabolic disturbance has been observed so frequently that it is taken for granted by most physicians. Thus, irrespective of the severity of the diabetes, an emotional stress will produce a rapid rise in the blood sugar concentration to such levels as to cause an increase in glucose excretion. Some of the emotional factors which can cause such fluctuations of severity were elucidated by Daniels and by Meyer, Ballmeir and Alexander.²¹ The latter demonstrated that

that even with transfusions of whole blood and plasma her blood pressure did not come up to 100 systolic until 26 hours later when her abdomen had again become soft. Previously to this attack her blood pressure had been 100/55 and her pulse 95. Her condition did not improve past this point and so operation was performed on February 19, at which time her pulse was 120 and blood pressure 96/70.

The abdomen was opened through a left rectus incision and no free fluid or evidence of peritonitis was found. There was a mass about the size of a hen's egg attaching the first portion of the duodenum to the transverse colon. We thought it wise to leave the mass entirely alone. Following the method outlined by Devine in exclusion operation was performed, transecting the stomach at the middle third. The lower end was turned in and completely closed in layers; the upper end was anastomosed to an ante colic 15" loop of jejunum. She was ambulatory after the third day, and was discharged from hospital on the eleventh day with a clean wound, feeling fairly well.

She was seen again on July 4, 1947, and at this time was complaining of weakness and poor appetite. She had been working quite hard in their grocery store and could not eat large meals. Her weight was 100 pounds. At this time she was given iron by mouth and advice regarding diet with emphasis on frequent small feedings. Following this she again began to pick up. At the middle of September her physician stated that she began to complain of pain in the epigastrium. This time the pain was more central and was relieved by the taking of food, especially if she drank a glass of milk. She was persuaded to have another gastric series and at this examination the radiologist, Dr MacNeill, reported that there was a large marginal ulcer on the medial side of the stoma between the stomach and the jejunum. He noted that the meal left the stomach fairly readily through the stoma and there was no evidence of any obstruction.

The patient was prepared for operation and on November 12 the abdomen was opened again through the left rectus incision. At this examination no lump whatever could be found in the pyloric area. The pyloric stump did not appear to be dilated and there were some adhesions in the area where the mass was previously seen and felt. This was not disturbed. The anastomosis of the stomach and jejunum was examined and appeared to be well healed and to have normal function. The liver was detached from its ligaments on the left side and retracted to the right. The left and right vagi were then isolated and a vagotomy done on each. The abdomen was closed in layers. The patient did very well following operation and was out of bed the next day. She was discharged from hospital on the 10th day following operation.

An x-ray on December 9, showed that there was very little evidence of ulcer visible where the large penetrating stomal ulcer appeared preoperatively. Also there was no evidence of stomal obstruction.

The patient is now free from abdominal pain, is eating moderately well and though still on frequent meals she is gradually increasing the amounts eaten at each time. It would seem as though she at last had a chance of permanent cure.

Several things about this case are interesting. Previous to the first operation she showed moderately high acid values of the stomach and had been in poor health for about seven years although she had never had a perforation or a hemorrhage. The true condition in her case was not suspected before x-ray as she did not have diarrhea or other symptoms pointing to a communication between duodenum and colon. At first our intention was

to do a fairly radical partial gastrectomy, but at operation we feared complications and the patient did not appear to be well enough for a vagotomy at that time. We did the exclusion operation as we thought it offered her the best chance of survival in our hands. The appearance of the stomal ulcer came fairly soon after operation but was a natural sequence of poor co-operation with diet and the presence of high acid values in her stomach. As her stoma functioned well vagotomy appeared to be the logical treatment the second time.

CONCLUSION

The above ease of benign duodeno-ileic fistula was reported because of the rarity of the condition. The ease contained complicating factors which made it most interesting and we feel that it has finally been brought to a state of cure and that it is likely to be permanent.

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METASTASIZING CARCINOID OF THE ILEUM SIMULATING METASTASIS FROM CARCINOMA OF THE RECTOSIGMOID

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Carcinoid has long been a subject of controversy and, consequently, a voluminous literature^{1 to 4} has arisen regarding this interesting but comparatively rare neoplasm. Numerous writers^{5 to 13} have already reviewed this literature. The purpose of this paper is to report a ease which illustrates to the surgeon the value of keeping the occurrence of carcinoid in mind so that it may not be mistaken for a manifestation of inoperable spread of another coexisting carcinoma.

A man of 50 came to the clinic, June 14, 1946, complaining of constipation of two years' duration which had required constant use of laxatives. He occasionally had suffered from mild crampy pains in the lower part of the abdomen which had become more severe and frequent in the six weeks preceding admission. These

pains were usually relieved by bowel movements. In the six weeks before admission of the patient the stools had become consistently blood streaked, but had shown no change in calibre. He had lost twenty pounds (9.1 kg.) in the last year and had noted loss of appetite recently. Nocturia which consisted of urination as often as twice a night occurred. Otherwise his history was negative. Ten days before admission he had been examined proctoscopically by his local physician who removed tissue from a rectal growth for biopsy. The pathologist diagnosed this tissue as adenocarcinoma, grade 2 (on the basis of 1 to 4, in which 1 is the least malignant and 4 the most malignant).

The patient was a poorly nourished man who appeared to be about his stated age. The temperature was 98.6° F. and the pulse rate 72. The blood pressure was 172/98. The only abnormal physical findings were in the abdomen. Here there was slight voluntary splinting, but the liver and spleen were not palpable and no abnormal masses were found. Rectal examination revealed an irregular, hard, fixed mass high in the right wall of the rectum. The prostate was slightly enlarged. On proctoscopic examination an annular, fixed carcinoma, which was found on biopsy to be adenocarcinoma, grade 1, was observed 10 cm. above the ano-rectal junction. Examination of the blood and urine gave negative results.



Fig. 1.—Left: Annular ulcerated adenocarcinoma of the rectosigmoid. Right: A segment of the terminal part of the ileum with primary carcinoid below (arrow) and with a mass of involved nodes in the root of the mesentery. The primary growth demonstrates typical kinking of the bowel.

Operation was performed by one of us (J.M.W.) on June 21, 1946. On exploration a large, rather fixed growth in the upper part of the rectum and rectosigmoid, with adjacent peritoneal implants, was disclosed. In addition, a small tumour was found in the terminal part of the ileum approximately 12 inches (30 cm.) from the ileocecal valve. This nodule was hard and yellowish and had caused sharp angulation of the bowel as a result of puckering and adhesion of the serosa. The subjacent lymph nodes were enlarged and appeared to be involved by a similar tumour (Fig. 1). Because carcinoid was suspected, a frozen section was made which confirmed the suspicion; accordingly, 12 inches (30 cm.) of small bowel, along with a large segment of mesentery which contained the involved nodes, was excised. Aseptic, end-to-end ileo-ileostomy was then effected with the aid of a three bladed clamp. The rectal lesion, along with its peritoneal implants, was removed by abdominoperineal resection. The sphincters, however, were preserved. The superior haemorrhoidal

vessels were severed at their origin, the marginal artery was preserved and the rectum was mobilized from the hollow of the sacrum and seminal vesicles. The redundant bowel was covered with peritoneum. From the posterior approach, the bowel was severed just above the pectinate line without division of the sphincters, and the upper part of the sigmoid was brought down through the intact anus with a Payr clamp.

The portion of ileum removed contained a button-like, yellow nodule, 1.5 x 1.5 x 0.5 cm., which did not extend to the serosa. The cut surface was smooth and yellow. The lesion was sharply defined from the normal tissue. The nodule was primarily situated in the submucosa and muscularis and did not project into the lumen. The mesentery contained three lymph nodes in which similar tumour tissue was found. On microscopic examination sections from the primary growth and lymph nodes were found to reveal evidence of typical carcinoid. They all contained uniform, cuboidal, spherical and cylindrical cells which were arranged predominantly in

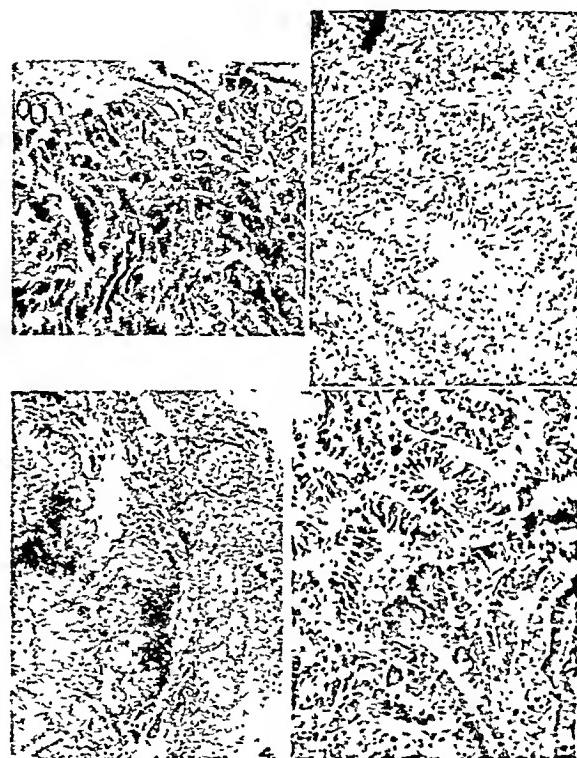


Fig. 2.—Primary carcinoid of the ileum. Bases of several normal crypts are seen at the top with cords of tumour cells extending down into the submucosa (x55). Fig. 3.—Primary carcinoid of the ileum. Bases of crypts at top with tumour cells in solid masses extending through the muscularis mucosae (x200). Fig. 4.—Metastatic nodule of carcinoid in mesenteric lymph node. Solid masses of cells similar to those in Fig. 2 are visible (x55). Fig. 5.—Primary adenocarcinoma of the rectosigmoid, grade 1. High columnar epithelium, hyperchromatic nuclei, large nucleoli and marked loss of polarity are evident (x200).

solid cords and clumps. In some places palisading of the peripheral cells was observed. The nuclei were vesicular, round and regular, while the cytoplasm was finely granular, with indistinct borders (Figs. 2, 3 and 4).

The specimen of rectosigmoid measured 10 inches (25 cm.) long and an annular, ulcerated adenocarcinoma, 7 x 5 x 1.5 cm., was present 5 inches (13 cm.) from the distal end. Microscopic examination revealed that

six lymph nodes in the adjacent mesentery and the pelvic peritoneum noted at operation contained similar tumour tissue. All those tissues were characterized by irregular glandular structure having acini lined with high columnar epithelial cells which showed hyperchromatism, loss of polarity and numerous mitotic figures. The tumour extended completely through the bowel wall. The pathologist's diagnosis was adenocarcinoma, grade 1, type C (Dukes' method, Fig. 5).

The patient's course was complicated by a moderate degree of ileus which necessitated use of a Miller-Abbott tube from the third to the seventh postoperative day, after which, in so far as the gastro-intestinal tract was concerned, progress was uneventful. On the thirteenth day phlebitis developed deep in the left calf, but subsided, with no sequelæ, after nine days of treatment with hot packs and dicumarol. From the time of operation the patient suffered from urinary retention and required catheterization. On the thirty-fourth post-operative day cystoscopic examination revealed hypertrophy of the lateral lobes of the prostate, grade 1 (graded on the basis of 1 to 4 in which 1 represents the least severe and 4 the most severe condition). There was considerable obstruction and diffuse cystitis, grade 2. The patient finally began to urinate satisfactorily on the forty second postoperative day, after instillation of 1:5,000 solution of gentian violet. A week's treatment of the bladder with 5% argyrol by lavage reduced the residual urine to only 40 c.c. The patient was dismissed on the fifty-third postoperative day. At that time he had good rectal control except when diarrhea developed from dietary indiscretion.

COMMENT

Even though carcinoids are rare tumours, comprising only 2.5% of the malignant tumours of the small bowel^{5, 14} and 0.2%^{5, 6, 11} of all gastro-intestinal neoplasms, they are important to the surgeon because they are so amenable to surgical treatment. There is no longer any justification for considering these neoplasms benign¹ as they have been found to metastasize by direct extension, by embolic spread through lymphatic channels to the regional nodes and by invasion of blood vessels with eventual involvement of the liver.

According to a number of reports,^{5 to 8, 11 to 16} evidence of metastasis was found in 20 to 43% of cases of carcinoid of the small bowel. On the other hand, it must not be forgotten that the rate of growth of carcinoid is usually slow and that a number of people have lived for many years in good health after removal of the primary growth, even though metastatic lesions have been left in the liver and other regions of the abdomen. The two extremes of malignancy are illustrated by two cases. The first, reported by Porter and Whelan¹² showed no increase in size of a metastatic lesion when necropsy was performed twenty years after the tumour was first noted and not removed at laparotomy. The second patient, observed by Watz¹⁶ died of multiple metastatic lesions eight months after

the primary growth and all evident metastatic growths had been excised.

Unquestionably, most carcinoid tumours of the small bowel are present for many years without giving rise to symptoms and the condition is only rarely diagnosed clinically. The symptoms when present, are those of mild, slowly progressive, chronic intestinal obstruction. Miller and Hermann¹⁷ and Dockerty and Ashburn⁸ have pointed out that carcinoids are the only small, nonulcerating, submucosal tumours which cause acute kinking of the small bowel. More careful roentgenologic studies of the small intestine may raise the accuracy of preoperative diagnosis. Nevertheless, the combination of circumstances encountered in this case will probably arise again. The presence of carcinoid was not even suspected before exploration, and any symptoms which may have been due to it were ascribed to the more evident rectal lesion. As the increase in life expectancy permits more people to live into the age in which cancer is most likely to develop, a larger percentage of the few people harbouring silent carcinoids will be explored because of other tumours. This view is substantiated by the fairly frequent reports in the literature of carcinoids found incidentally, at necropsy or on exploration, in patients suffering from other tumours. In Ariel's review,⁵ in 7 of 39 cases of carcinoid of the small bowel the carcinoids accompanied other malignant tumours while 1 of 11 of Ariel's own patients had an adenocarcinoma of the ascending colon. Dockerty and Ashburn mentioned that in 2 of their 30 cases of carcinoid of the ileum the carcinoid co-existed with other carcinomas.

When one remembers that multiple primary growths are found in 20 to 50% and metastatic growths in 20 to 43% of reported cases of carcinoid of the small bowel,^{5 to 8, 11 to 13} it is easy to understand how these tumours may be mistaken for implants in the small bowel and its mesentery. On the other hand, metastatic lesions in the small bowel are unusual in the early stages of most intra-abdominal carcinomas. Thus it is well for the surgeon to keep this tumour in mind before closing the abdomen in an otherwise operable case of carcinoma in which there seems to be an apparently incurable extension to the small bowel. This is especially so if the nodules are only palpated through an incision in the upper part of the abdomen.

SUMMARY

A case of metastasizing so-called carcinoid of the ileum, in which adenocarcinoma of the rectosigmoid, grade 1, occurred simultaneously, has been reported. The possibility that carcinoid of the ileum may be mistaken for evidence of inoperable spread of another coexisting carcinoma, thereby depriving the patient of a chance of cure of both lesions, has been pointed out.

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HYPNOSIS AS AN EXPEDIENT IN OBSTETRICAL ANALGESIA

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Mrs. J.W., aged 34, of Quatsino, B.C., came forty miles by sea to St. George's Hospital, Alert Bay, requesting prenatal care on August 21, 1946. Confinement was expected about February 15, 1947. The patient was a stocky, healthy, intelligent Kwawkewlth Indian woman with a fair command of English; previous medical history was negative; her last pregnancy had ended normally seventeen years ago. She was conscious of headache and fatigue after the day's work, never oedema or urinary symptoms, but had palpitation and pounding in the ears occasionally at night. Pelvimetry showed a spacious gynaecoid pelvis.

On this and visits in November and December she had a hypertension of 165/105-100 to 180/100-90 and negative urinalysis despite some nocturia. Returning January 30, 1947, to await confinement she showed albuminuria, blood pressure 170/115-100, no oedema or excessive weight gain; and, failing to improve on rest and strict diet was admitted on February 5 with the diagnoses of (1) elderly primipara, near term; (2) probable essential hypertension; and (3) pre-eclampsia.

Hypertension and albuminuria were controlled quickly on hospital regimen; medical induction attempted twice produced weak pains, soon failing; the membranes were ruptured on February 10. By mid-afternoon hard labour was established. Heroin gr. 1/12 at 7.30 p.m. relieved her distress but caused nausea and vomiting.

At 10 p.m. the cervix was fully dilated and she was prepared and draped for delivery. In expected normal

deliveries our custom was to have the senior nurse give open ether under the physician's supervision: to our consternation the patient firmly revolted at the pungency of the ether and despite reassurance refused also the less unpleasant ethyl chloride. After a few moments of whispered confusion, the nurses were warned to maintain their composure at what they should hear, and an attempt at hypnosis was commenced, despite deep misgivings as to the patient's language limitations and the strained and unusual circumstances. No explanation or warning was offered: the patient was simply told to lie quietly and listen very carefully to directions, to close her eyes, relax, and breathe deeply, then that she would become, and was becoming, very tired and would fall, and was falling, sound asleep; that she was deeply asleep; that she would be very comfortable and feel no pain. These suggestions were repeated cyclically, and naturally, to the point of monotony, without being more specific as to what she would not feel. Vaginal examination, as a test, failed to elicit the flicker of an eyelid; the perineum was "ironed out"; forceps were applied, firm traction and fundal pressure added: the patient's respiration continued deep and quiet and her features peacefully frozen. Even performance of a right mediolateral episiotomy roused no movement or outcry. A 7 lb. 5 oz. boy was delivered by LOA mechanism and cried lustily. There was no reaction to the routine injections and expression of the placenta, but finally the patient winced and whimpered, though remaining passive, as the perineum was repaired. She was told repeatedly that she would remember no pain or unpleasantness, and would feel very comfortable, then simply to "Wake up now". She opened her eyes, blinked dazedly, and was taken to bed without further ado; the nurse noted that she passed a good night, sleeping on and off. Twelve hours following delivery she was questioned for the first time. She stated, with a puzzled smile, that she could recall nothing of the delivery, and "I didn't even hear the baby crying".

The post-partum course was afebrile and uneventful; lactation being inadequate the baby left the hospital on supplementary formula, having regained birth weight and been circumcised. The mother's blood pressure was 124/90 and urinalysis negative on the ninth day. She regarded the event with equanimity and perhaps unexpressed amazement.

DISCUSSION

A hundred years ago the mesmeric movement was in flood tide, counting ranking medical men among its participants, though it was intimately bound up with occult speculation until the work of James Braid (fl. 1843) who first used the terms hypnotism and neurohypnosis and postulated suggestion as their basis.^{1, 4, 10} The use of hypnosis for surgical anaesthesia culminated in James Esdaile's remarkable series of several thousand operations, three hundred of them of the major type, in India during 1845 to 1851. "Orthodox medicine, committed to a denial of the efficacy of psychic healing", welcomed the advent of ether and chloroform,⁴ and hypnosis passed back into the hands of travelling showmen until it again became a serious medical study at the end of the century. Cobb⁶ cites a case of psychosis cured in 1828 following a convulsion caused by camphorated oil, and logically suggests that the immaturity of the psy-

chiatrie field was the factor responsible for the failure of the "shock therapies" to appear for over a hundred years. This explanation would seem equally applicable to the decline of hypnosis.

The ideal obstetrical analgesic and anaesthetic is still being sought; that is, an agent having toxic effect on neither mother nor fetus, selectively obtunding pain sensation while promoting a maximum of voluntary co-operation. Reports on the use of hypnosis in labour fulfil these criteria so well that we must ask whether, far from a mere freak, a valuable agent is being neglected by obstetricians and anaesthetists. All medical practitioners use suggestion, many directing it purposefully, and some employing actual hypnosis, in daily medical problems. One of the aims of a previously published series,⁷ of five minor surgical procedures out of six attempts successfully done under hypnosis, was to ascertain whether the method might be drawn upon when other agents failed or were not available. Sampimon and Woodruff¹¹ report 26 of 29 dental and surgical procedures succeeding under hypnosis, the work being born under extreme deprivation of medical supplies in a Japanese prisoner of war camp. These authors noted little racial variation in susceptibility: the well-known verbal barrier may have been overcome, as in our case, by a greater susceptibility in persons of simpler (or more "primitive") cultural background. Certainly it is commonly noted that ill persons and those under nervous stress exhibit heightened suggestibility.

As an anaesthetic, hypnosis has two-fold limitations. First, the experience, time, and trouble required for successful induction: success has required careful preparation, as in Ward's historic amputation in 1842, the patient being "mesmerised" ten times preoperatively. Second, its limited applicability, anaesthesia being attained in from 15 to 90% of various series, as compared with the simple reliability of pharmacologic agents. Thirdly, it may be argued that pain is only suppressed, and not abolished, an objection which, of course, applies also to general anaesthesia according to Crile's hypothesis.

Hypnosis in surgery, obstetrics, and dentistry has been steadily reported on since 1880; a flock of successful cases appeared in the European literature in the early 1920's. More recently, Kroger and De Lee¹² have reported 11 of 12 cases managed successfully throughout labour,

the patients being carefully prepared in late pregnancy. The results, indications, and advantages presented by these authors are most impressive, and they castigate public prejudice as an obstacle to a safe and satisfactory analgesic, from which a fatality has never resulted. Although the above case represents only a successful expedient in a moment of impasse, the whole subject appears to merit further investigation.

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SPECIAL ARTICLE

MISTAKES AND PITFALLS IN
GENERAL SURGERY*

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When, in January last, I accepted the invitation of the Program Committee to speak to this title I did not appreciate the difficulties of the problem. I am sure the Program Committee did not intend, nor would you enjoy, a list of the mistakes that I as a general surgeon have made. One plan of approach after another has been drafted and discarded and finally I have decided to define and analyze the component parts of the title and to rearrange the order of sequence.

What is a General Surgeon? One answer is that he is the surgeon who does the cutting and stitching which is not done by any one or other of the special surgeons. Fifty odd years ago when I graduated there were in Montreal only 2 recognized branches of special surgery, ophthalmology and gynaecology. Otolaryngology ran these two a close third. But it was only after the lapse of some years that the special branches of urology and orthopaedics were developed. Now we have numerous divisions of surgery in addition to those mentioned: *viz.*, neurosurgery, traumatic surgery, plastic surgery, thoracic

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surgery, not to mention such subdivisions as proctology and similar artificially limited fields.

But the exponents of these special branches of surgery cannot prosper without a clientele. Therefore it is only in the large centres and especially in teaching centres that we find the development of such specialties. In this day and generation I believe the best exemplars of the all round general surgeon are found in the smaller centres with adequate hospital facilities. In fact I know quite a few who are in rural practice. They meet the emergency no matter what system of the human body is involved. They also honestly recognize their own limitations and refer the knotty problems to the specialist.

A surgeon, of whatever tint, is primarily a physician who is trained to employ mechanical methods of therapy. He must know the fundamentals of medicine. He is therefore a physician and craftsman. If only a technical craftsman he is not a surgeon in the deeper meaning of the word.

In my early days the training of a surgeon was almost invariably through general practice. Emphasis was placed upon a detailed knowledge of anatomy and the young men with surgical aspirations were found as demonstrators in the dissecting room. This postgraduate study of anatomy is now even more an essential, as undergraduate teaching of anatomy has been progressively whittled down.

But although a knowledge of anatomy permits the surgeon to safely find his way around he must also have a definite knowledge of pathological anatomy or pathology in the gross in order to recognize and differentiate the abnormal from the normal. And, as form is in large measure the handmaiden of function, the surgeon must have a basic knowledge of physiology and of physiological and pathological chemistry.

As a craftsman he must thoroughly know, not only the tools *with which* he works but the material *upon which* he works. And finally, he must possess a keen sympathy for, and understanding of, his patients.

He must fully appreciate that he is not treating a disease but a human being afflicted by disease. Oft times the surgeon must inflict pain. Oft times the patient must be made worse in order to be better. Under such conditions the mental comfort of the patient largely depends upon the humanistic attitude of the surgeon. Look back upon the really great surgeons you have known and in all you will find deep wells of human kindness. Did that characteristic detract in any way from their excellence as surgeons? Not at all.

A study of the portrait of Joseph Lister will at once reveal to you what I am so feebly endeavouring to express.

PITFALLS

A pitfall is a trap. Originally, the term implied a special form of trap; one from which there was no escape. We read in books of travel that pitfalls were digged by native peoples to entrap foes, whether man or beast. These natives possessed no weapons adequate for either defence or attack. The pits were digged with the surface opening smaller than the floor diameter and the slope of the sides made it impossible for the victim to climb out. The pit was then camouflaged.

But we also read that *wary* animals detected and avoided the most carefully constructed and hidden pitfall and so escaped destruction. The point is that the *wary* surgeon will *avoid* the pitfalls of practice.

Any one of you may call to mind a pitfall you have encountered. I will detail an example.

The anatomy and relationships of the extra-hepatic biliary passages are notoriously irregular. What is described as normal occurs in just somewhat over 30% of the total. Irregularities of bile ducts and blood vessels are legion and no one type of irregularity attains to anywhere near 30%. When the anatomy of this region is further complicated by disease or previous operation the irregularities are still more confusing.

Every textbook on anatomy states that in the gastro-hepatic omentum the portal vein lies dorsal to the common bile duct and hepatic artery. Very occasionally it will be found in front.

And if the gastro-hepatic omentum is a mass of scar tissue and the common duct possibly reduced to a fibrous cord the dissection will expose a portal vein in the position and with the appearance of a dilated common duct distended with dark stagnant bile. The *wary* surgeon may boldly incise this apparent duct and he is then most certainly in a "pitfall" from which there is no escape.

The *wary* surgeon, no matter how regular the anatomy may appear to be, will aspirate with a fine needle the supposed distended duct and assure himself as to whether the contents are bile or blood. But the needle must be plunged through the entire thickness of the wall and into the lumen; otherwise blood may be aspirated from one of the many tortuous veins in the wall of a common bile duct.

Another example from the same region is the presence of a small accessory right hepatic bile duct which, undetected and divided, may slowly flood the peritoneal cavity with bile, producing a peritonitis which at best means a long disappointing illness, and may cause death.

The *wary* surgeon will therefore remove the gall bladder from the fundus back to the ducts in order that the presence of such an accessory may be exposed and adequately dealt with.

MISTAKES

Let us soften that word to "errors". And what distinction may we draw between pitfalls and errors? Well, as we have seen, a wary surgeon may avoid a pitfall; but only an omniscient surgeon can avoid all errors. There are errors of omission and errors of commission. In the former class I would place the failure to obtain an accurate and detailed history and to complete a physical and clinical examination. In these days we are too prone to slur over these most important procedures and begin the taking of evidence in the laboratory and x-ray departments.

The practice of medicine may be likened to the procedure in a court of justice. The presiding judge hears the evidence which: (a) may be conclusive, and he renders judgment without hesitation; (b) may be inconclusive, and he demands more evidence; (c) may be confusing and contradictory and he sifts the evidence from all angles before arriving at a decision.

The science of medicine has made wonderful progress but I have always thought that its pathway has been largely along the lines of accumulating more and more accurate evidence. The art of medicine (and of surgical medicine) is the weighing of this evidence and by the exercise of good judgment to arrive at the proper verdict.

For instance: many an abdomen has been opened because of the presence of the symptom triad, vomiting, pain, and abdominal tenderness. But if in the taking of the history it is found that the vomiting has preceded the onset of pain that patient has some malady other than a visceral lesion, possibly the abdominal crisis of impending diabetic coma.

But to avoid errors in diagnosis one must have wisdom born of experience. To quote: "A fool learns only by his own experience; a wise man by the experience of others". That "experience of others" is gained by study, by reading and by attending meetings such as this convention.

Francis Bacon says in his Essays—"Reading maketh a full man—and if he read but little he hath need of much cunning to seem to know what he doth not". But again he says "Some books are to be tasted, others to be swallowed, and some few are to be chewed and digested". And Moynihan, that master of surgery as well as of rhetoric, said "Statistics can be made to prove anything, sometimes even the truth".

Statistics and tabulations have their value, but each individual patient is a separate problem. A surgeon may be a voracious reader but unless he ponders what he reads and with discrimination separates the wheat from the chaff his mind will be in a constant turmoil and his judgment will be faulty.

Errors of commission occur more particularly at the operating table. I believe the most

common fault is lack of respect for living tissues; rough handling, swabbing with dry gauze, tearing and blunt dissection, mass ligation of tissue and the use of heavy ligature material. Surely we appreciate that devitalized tissue has no resistance to infection, and contrariwise, that infection has much difficulty in gaining the ascendancy over vital tissues.

We are too prone to rely upon chemotherapy and the antibiotics to control infection and have perhaps become somewhat careless in respect to the niceties of surgical manipulation. To abstract from Trueta's address in Ottawa last fall—Infection has two components—the "seed" and the "soil".

The lessons of the two Great Wars, especially of World War II have definitely demonstrated that excision or debridement of a wound is of far greater importance than chemotherapy which is of complementary value. Hence, it is a mistake, and bad surgery, to unnecessarily damage and devitalize a single cell by rough handling of tissues.

Even in examination of a patient gentle handling will furnish much more reliable evidence. Whose abdomen will not flinch at a prod from the end of a finger? And thereafter will reflexly protect itself from even a lighter touch.

An abdomen should be surveyed lightly with a warm flat hand, then again with more firm pressure and finally with localizing deep and perhaps finger point pressure. The same principle applies to the examination of any painful part of the body. In children it is wise to start examination on some part of the body quite distant from the focus of complaint and work from the periphery towards that centre.

Another error is to discard well proved procedures for something new. The Levine, Miller-Abbott, and other tubes, with Wangensteen suction, have proved their value and are here to stay. But they have their limitations, also their discomforts. Where decompression of the colon is indicated a cæcostomy or temporary colostomy is far more effective. A properly performed cæcostomy will effectively drain the small intestine, will relieve tension in the colon although it may not empty it, is of less discomfort than a tube through the nose and will always close spontaneously. This is not to deny that both the tube and the cæcostomy are required in some instances.

To carry this illustration further. It is not enough in resection and anastomosis of the colon to sterilize the content of the intestine by protective exhibition of the sulfonamides and antibiotics. There is the mechanical factor to be met, the distension of the colon proximal to the anastomosis, the resumption of active peristalsis, both of them placing strain upon

the suture material but more especially upon the tissues sutured. Hence the advantages of a blow-off vent in the proximal colon (eæostomy or temporary colostomy).

Another error is to assume that a demonstrated lesion is the one producing the complaints, ignoring the actual lesion which is the real cause of trouble. The most flagrant and frequent instance of this error is in the diagnosis of rectal bleeding. Haemorrhoids are so common and so easily recognized by patient and surgeon alike that treatment for them is frequently given in a casual manner and too often even without a digital examination.

The possession of haemorrhoids is no insurance against the presence of some other lesion. Moreover the discomfort produced by some other lesion is frequently the cause of the later development of haemorrhoids.

Therefore the only safe method is to carry out an examination in progressive steps until a lesion is found which adequately explains the symptoms and signs and the character of the bleeding. A meticulously taken history with all details noted; the character and frequency of the stools; the presence or absence and character of pain or discomfort; the colour and quantity of the blood; the presence or absence of mucus; the odour of the evacuations... Then, in order: examination of the abdomen; inspection of the anal orifice; digital examination; proctoscopic examination, which is an office procedure; sigmoidoscopic examination which requires a tilting table and finally a barium enema under the fluoroscopic screen.

At the risk of being considered reactionary, I will now state my opinion that a multi-stage operation is good surgery. We may correct anaemia, hypoproteinæmia, the electrolytic balance, vitamin deficiencies, etc., and still have a patient die from too prolonged a session on the operating table.

Granted the disadvantages of prolonged hospitalization, risks of repeated anaesthesia and postoperative complications. But the advantages of a living patient in the end outweigh all these disadvantages.

The proponents of an extensive one-stage operation are usually surgeons not only of vast experience but with an efficient team of similar experience. It behoves the rest of us to be cautious against over-reaching ourselves and our resources in attempting to emulate their example.

The objective of all treatment is to prolong a useful life. If a radical procedure entails a high operative risk and with little promise of complete cure; if a palliative procedure entails little or no operative risk but a limited duration of life I firmly believe that it is the duty of the surgeon to be candid with the patient and to allow the patient to be the arbiter of his own destiny.

I ally myself with those surgeons who believe in the avoidance of a permanent colostomy even at slight risk of local recurrence. At the very best a colostomy is a nuisance and the care of it demands living facilities of at least a moderate standard. For the homeless a colostomy is a calamity. He cannot retain employment nor find lodgings and finally drifts, if lucky, into an institution for vagrants.

I could easily multiply instances of errors both of omission and commission but have attempted to present the theme under generalizations and categories. If I have given you food for thought I am satisfied and rewarded, and leave with you this sentence which is pregnant with meaning: "A minor procedure often entails a major responsibility".

SUMMARY

A surgeon is both a physician and a craftsman. Pitfalls may be avoided by the wary.

Errors are the result of haste and of misinterpretation of the evidence gathered by history and examination.

And in spite of all our efforts and care to avoid and retrieve errors and pitfalls, failure at times will be our bitter portion because we do not yet understand LIFE itself.

CLINICAL and LABORATORY NOTES

PLASMA PROTEINS IN PREGNANCY

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In a previous study (*Am. J. Obst. & Gyn.*, May, 1948) it was observed that the concentration of the plasma proteins became decreased throughout normal pregnancy, until late in the third trimester, and then rapidly rose to normal by the early postpartum period. It is now clearly established that this is due entirely to the normal diluting process of the blood, as shown by changes in the haematocrit, which parallels the fall in blood proteins.

It was also observed that a more marked degree of plasma protein decrease occurred in pre-eclampsia and eelampsia. The assumption that this represented a true or absolute hypoproteinæmia, seemed justified by the observation that there was no parallel fall in the haematocrit, in these conditions.

The cause of hypoproteinæmia in toxæmia is not established. Any plasma protein depletion may result from acute loss of plasma; excessive excretion of nitrogen; chronic under-nutrition of protein; or failure of formation of albumin and the globulins. Because liver

function seems to be impaired in toxæmias of pregnancy, it is probable that there is a failure of formation to some degree. It is now well established that cystine is essential for proper plasma protein synthesis. Methionine however, appears to be a precursor of cystine in the body, and is vital to health. This assumption is justified by the following observations:

1. Chronic protein depletion in animals will produce necrosis of the liver, generalized œdema, bloody exudates in the abdomen and chest, and commonly, cortical necrosis of the kidneys. The addition of methionine to the diet of these animals will universally prevent, and sometimes reverse these changes.

2. In protein depleted animals, the addition of methionine to the diet will to a marked degree, prevent death from the toxic hepatitis produced by chloroform, carbon tetrachloride or arsenic. Such protection cannot be provided by methionine in the animal which has not been previously starved of protein.

3. Methionine has been shown to greatly increase the clot retraction of blood from patients suffering from essential thromboeytopenia.

- TOXIC ABRUPTION
1. œdema, hypertension and albuminuria.
 2. Spontaneous bleeding—placenta, purpura, haematuria, retinal, etc.
 3. Thrombocytopenia often found, clot retraction delayed.
 4. Hypoproteinæmia severe.
 5. Bilateral renal cortical necrosis—common.
 6. Fatty changes and necrosis of the liver.

4. Methionine has produced dramatic reduction and control of bleeding in patients with both essential and toxic thrombocytopenia.

In our toxic group, the most marked decrease in concentration of the plasma proteins, seemed to occur in patients who in addition to œdema, albuminuria and hypertension, had abruptio placentæ. In this condition it is common to note spontaneous bleeding from other parts of the body as well as the uterus, and we have repeatedly found a marked decrease in the number of platelets. A delay in clot retraction occurs, as in essential thrombocytopenia. These findings have been so consistent that on two occasions, accidental haemorrhage was accurately predicted.

Methionine has been administered with good results in three cases of toxæmia with these associated findings. The first patient was admitted with marked œdema, hypertension and albuminuria. After five days of the usual

treatment without improvement, methionine was given. At this time her platelet count was 68,000. There was an immediate diuresis, loss in weight, and general improvement. No bleeding occurs, and delivery three weeks later was uneventful. It is conceivable that methionine prevented accidental haemorrhage and stillbirth. The second patient was admitted in convulsions. She presented the classical signs and symptoms of eclampsia, and in addition a platelet count of 52,000, and no clot retraction occurred in twelve hours. She had vaginal bleeding, and repeated severe nosebleeds. The fetal heart tones disappeared after 48 hours. She was given intravenous protein hydrolysate, containing methionine, and spontaneous cessation of bleeding occurred. On the third day, normal clot retraction occurred in two hours. There was no undue bleeding at or following delivery. Stillbirth, with typical clots and immediate expulsion of a separated placenta resulted. It is conceivable that methionine prevented continued bleeding.

The third case was a typical abruptio placentæ, with toxæmia. There were associated retinal haemorrhages. Intravenous methionine

TABLE I.

TOXIC ABRUPTION	METHIONINE
1. œdema, hypertension and albuminuria.	1. Anasarca in animals after chronic protein starvation—prevented by methionine.
2. Spontaneous bleeding—placenta, purpura, haematuria, retinal, etc.	2. Control of bleeding in both essential and toxic thrombocytopenia in humans—with methionine.
3. Thrombocytopenia often found, clot retraction delayed.	3. Marked increase in clot retraction in thrombocytopenic blood, both <i>in vivo</i> and <i>in vitro</i> —with methionine.
4. Hypoproteinæmia severe.	4. Methionine or cystine proved essential in formation of plasma proteins.
5. Bilateral renal cortical necrosis—common.	5. Renal cortical necrosis produced in dogs by chronic protein depletion. Prevented by methionine.
6. Fatty changes and necrosis of the liver.	6. Protection by methionine against liver necrosis by toxic substances in protein depleted animals.

was administered, with recovery. No abnormal bleeding followed delivery.

These experimental and clinical findings (Table I) seem to justify the conclusion that:

Pre-eclampsia and eclampsia are due to the action of an unknown toxin. If this agent attacks a woman who has not been previously depleted of protein, the clinical picture of œdema, hypertension, albuminuria, with or without convulsions will result. Because of her protein protection, there is no danger of abruptio placentæ, there will be no thrombocytopenia.

If however, this agent attacks a woman who has been previously depleted of protein, the clinical picture of œdema, hypertension, albuminuria, and perhaps convulsions will result, but in addition there will be great danger of an associated abruptio placentæ, with thrombocytopenia. This condition may be prevented by the administration of methionine.

CONTROL OF CAR SICKNESS IN A
DOG BY V-12 (MOSIDAL)

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Nohle, Sellers and Best¹ have reviewed the studies sponsored by the National Research Council of Canada on the treatment of motion sickness. In the course of these studies Noble tested the effectiveness of a large number of barbiturates and found one drug, designated V-12 (ethyl-β methyl-allyl thiobarbituric acid) which showed particular promise. This drug was found to prevent swing sickness in all susceptible dogs tested and no serious side effects were apparent. The belladonna alkaloids, atropine, hyoscine, and hyoscyamine, did not prevent motion sickness in dogs. The effectiveness of V-12 in human subjects varied among individuals.

It seems of interest to report that V-12 has been found during the past three years, to be completely protective against car sickness in a dog. The dog is a male mongrel shepherd, now 6 years old, weighing 25 kg. When untreated he invariably begins to salivate profusely shortly after starting on an automobile trip and vomits within six miles of driving.

When the drug[‡] has been administered at least one hour before commencing an automobile trip the dog has never salivated or vomited or shown any obvious symptom of car-sickness. In preparation for long trips, about 250 miles, the dog has received one capsule, 160 mgm., of V-12 by mouth three mornings in succession, the last dose being given on the day of the trip. However, such preparation may have been unnecessary since for many shorter trips the dog has been completely protected throughout the day by a single, 160 mgm. dose an hour or more before starting. The only failure was on an occasion when the capsule was administered about 30 minutes before starting. Since V-12 was first used treatment has been omitted on a number of occasions and salivation and vomiting has occurred each time.

No ill effects of the dose have ever been noted; the dog remained alert, active and friendly. On a number of occasions the drug has been used before driving to the base of a mountain for a day's strenuous climbing. The dog was spirited and energetic throughout the climb and remained protected on the drive home.

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† Department of Medical Research, University of Western Ontario.

‡ The V-12 was supplied by Abbott Laboratories and now bears the trade name of Mesidal.

The same drug has been used on two occasions for three girls aged 4, 9 and 16 years, all susceptible to car-sickness. They received 50, 80 and 160 mgm. respectively, before breakfast on three successive mornings before long trips. The definite impression was gained that the drug was useful; none of the children vomited. But it did not appear to be completely protective against feelings of discomfort in the case of one child (9 years) and the observations were not well controlled. No signs of ill effect were obvious.

REFERENCE

1. NOBLE, R. L., SELLERS, E. A. AND BEST, C. H.: *Canad. M. A. J.*, 56: 417, 1947.

WORLD REPORT ON VENEREAL DISEASES STRESSES POSTWAR DANGER.—World-wide increases in the venereal diseases reported during wartime continue unabated into the postwar period, according to a report published in the February issue of the *Journal of Social Hygiene* by the American Social Hygiene Association.

The report, unique for its comprehensive coverage and statistical detail, calls new attention to the virtually universal threat to public health arising from VD prevalence and notes that this threat is intensified by present-day speed and scope of population movements between countries.

Prepared by Thorstein Guthe, M.D., formerly of the Norwegian Health Service, now World Health Organization Medical Officer at Geneva, and John C. Hume, M.D., of Johns Hopkins University School of Hygiene and Public Health, with the collaboration of other experts, and approved for publication by the U.S. Army and the U.S. Public Health Service, the report asserts that war intensifies venereal disease problems not only during the period of actual conflict but later as well, adding:

"After the war, venereal diseases still remained a public health problem in all countries, and the impact of military occupation and demobilization has reflected itself in venereal disease rates even higher than those observed during the war."

The report proposes a whole series of recommendations for national and international action to strengthen efforts for VD control. These include proposals for uniform reporting procedures on a world scale; international use of national control measures; establishment of administrative, scientific and procedural standards, within the framework of a uniform plan to be worked out by the World Health Organization, the International Union against the Venereal Diseases, and other governmental and non-governmental agencies concerned.

Reprints of the report, which is being distributed internationally by the World Health Organization, may be obtained in the United States from the American Social Hygiene Association, 1790 Broadway, New York 19. (Pub. No. A-713. *International Aspects of the Venereal Disease Problem*, 40 cents; 50 cents if mailed outside the U.S.A.)

THE CANADIAN MEDICAL ASSOCIATION**Editorial Offices—3640 University Street, Montreal**

(Information regarding contributions and advertising will be found on the second page following the reading material.)

EDITORIAL**THE GASTRIC ACIDITY IN CARCINOMA OF THE STOMACH**

THE relation between the gastric secretory function of the stomach and the development of gastric carcinoma is not quite clear. It is recognized of course that the function is subnormal in many patients with carcinoma. But whether this reduction precedes or follows the carcinoma is yet to be determined. Recent data* have been compiled in the Mayo Clinic from the records of 277 patients in whom two or more gastric analyses had been made two years or more before the diagnosis of cancer. This lower limit of time made it fairly certain that cancer was not present at the time of the initial gastric analysis. Actually there was an average interval of 11.2 years.

In summary, it was found that the mean secretory activity had been subnormal over this 11.2 year period before the diagnosis of cancer was made. This subnormal function was characteristic of these pre-cancerous patients in any decade of life, but more marked in the later decades. It seems therefore that in this group the process responsible for the low gastric secretory function had been active early in life and in many cases, for long periods before carcinoma developed. And this process had affected the secretory function more in the later than in the earlier decades: it was progressive.

What is the reason for the depression of gastric acidity? It cannot all be attributed to the effects of cancer, as an important part of the depression of the acidity preceded and did not follow the carcinoma. In the opinion of the authors chronic atrophic gastritis is responsible for an important part of the lowered acidity. Theoretically, however, carcinoma might produce gastritis; or it might encroach

upon the acid-producing cells; or it might increase neutralizing fluids by exudation from the surface of the tumor; or produce amines which would reduce acidity. These effects however are difficult to link up with the very long period which so often existed (as long as 39 years in one instance) between the discovery of the subnormal acidity and the development of carcinoma.

EDITORIAL COMMENTS**Income Tax Deductions for Convention Expenses**

It was, unfortunately, unavoidable that the announcement regarding income tax concessions was rather inconspicuously placed in last month's issue of the *Journal*. Perhaps therefore it may be as well to make further reference to it. In effect, we have now obtained from the Department of National Revenue assurance that deduction of expenses incurred in attendance at medical meetings will be permitted for income tax purposes, effective January 1, 1948. The meetings thus allowed for are three in number: one per year of the Canadian Medical Association; one per year of either a Provincial Medical Association or a Provincial Division of the Canadian Medical Association; one per year of a medical society or association of specialists in Canada or the United States. The expenses must be reasonable and properly substantiated with proof of claim for the number of days present at the Convention and for the expenses incurred, separating transportation, meals and hotel expenses, for which vouchers should be obtained and kept available for inspection. No such expenses will be allowed against income received as salary.

Certificates for the annual meeting in Toronto and for the meeting of the Ontario Division in the same week may be obtained from the General Secretary, 135 St. Clair Avenue West, Toronto 5. The actual number of days in attendance at the meetings should be indicated. Those who attended the Annual Meeting of the Quebec Division last April should communicate with the Secretary, Dr. G. W. Halpenny, Medical Arts Building, Montreal. Those wishing proof of attendance at Specialist Societies held in 1948 should apply to the Secretary of the appropriate organization.

* Gastric Acidity before and after the Development of Carcinoma of the Stomach. Mandred W. Comfort, Mavis P. Kelsoy and Joseph Berkson, *Proc. of Mayo Clinic*, 23: 129, 1948.

Immunization Week

The sixth national immunization week for Canada is being observed during the week of September 12, under the sponsorship of the Health League of Canada and in co-operation with Dominion, Provincial and Municipal Health Departments. Efforts are being concentrated on protecting children against diphtheria, smallpox and whooping cough. The almost complete elimination of smallpox by vaccination can be paralleled by the elimination of diphtheria, and the value of whooping cough vaccine is well established. But the elimination of these preventable diseases is still a matter for the future. Diphtheria still shows more than 100 deaths annually, and whooping cough more than 200 annually. Scarlet fever also shows a hopeful diminution in mortality. But eternal vigilance is the price of safety, and this plan of a national immunization week is one of our continual reminders of this important truism.

The Care and Treatment of the Elderly and Infirm

In 1946 a resolution was adopted in the British Medical Association to the effect that present day provision for treatment and care of the elderly and infirm is inadequate. A committee was set up to deal with the question and its report is now available. What focuses attention on this matter is the rapidly growing realization of the change that is coming over the make-up of Britain's population. Forty years ago there were $2\frac{1}{2}$ million people in the country over 60; today there are $6\frac{1}{2}$ million; and it is estimated that by 1971 there will be $9\frac{1}{2}$ million. Unfortunately this development is so gradual comparatively speaking, that it does not evoke a sense of urgency in keeping with its inexorable nature. The Committee was charged with the duty of investigating the existing provision for treatment and care of the elderly and infirm, which is considered to be inadequate. There is apparently no systematic policy for the welfare of the elderly, although there is evidence that the social conscience is awaking to the problem. Even what is being done however is directed towards the care of the fairly healthy elderly people, not the infirm or incapacitated or permanently incurable.

The Committee therefore first classified persons above 60 into elderly: elderly and infirm: elderly sick, acutely or irremediably; psychiatry; and other special groups. The report is carefully detailed, and while it is realized that any building measures for achieving an improved medical service must inevitably be slow, in these days of restricted building, plans cannot be put forward too soon. What can be done now is to awake the community to the degree of melancholy and suffering that attends such a large and increasing section of the population.

MEN and BOOKS**MILESTONES IN CANADIAN MEDICINE***

Heber C. Jamieson, M.B.

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Three and a half centuries ago the first European colonists arrived at Acadia under Champlain and encountered their first formidable obstacle to settlement—scurvy. Two apothecaries, Daniel Hay and Louis Hebert the first men with any medical skill to practise in Canada accompanied this small group of immigrants. During the first winter many succumbed to scurvy and others were incapacitated so that the projected colony seemed doomed to failure. The preventive method of drinking spruce tea which Jacques Cartier had learned from the Indians over half a century before was unknown to these practitioners and so no relief was found for the stricken people.

Hebert returned to France to qualify as a surgeon and to find what cure might be available for scurvy. In 1608 he arrived at Quebec where a new and larger settlement was planned:

It is interesting to recall that Canada was invaded by home seekers from the four points of the compass. The French came from the East by way of the St. Lawrence and were menaced by scurvy. The United Empire Loyalists left the New England colonies after 1776 to occupy parts of Nova Scotia, New Brunswick, Quebec and Ontario and had already learned how to avoid this disease. The Selkirk settlers arrived by way of Hudson Bay from 1811 to 1815, and soon adopted the eating habits of the company officials and so escaped this affection. There is no mention of scurvy among the early residents of Victoria where Dr. John S. Helmcken became the first doctor about 1850.

Aside from scurvy and the accidents and common ailments incident to a healthy outdoor life in New France the chief concern of the medical men and governors was to prevent the entrance of epidemic disease frequent in the country from which the ever increasing flow of immigrants came, and to curb its spread once it had gained a foothold in the new country. A striking contrast is noticed in the medical histories of the Spanish invaders of the West Indies and Mexico on the one hand and that of the French on the other. Whereas the Spaniards contracted from the natives yellow fever, malaria, and probably syphilis, the new conquerors of Canada imported and disseminated among the Indians smallpox, typhus and cholera. Undoubtedly smallpox

* Read at the Seventy-eighth Annual Meeting of the Canadian Medical Association, Section of Historical Medicine, Winnipeg, June 27, 1947.

was the first and greatest scourge. It wiped out whole tribes of Indians and was so widespread that in time epidemics reached the far western plains with devastating results.

The medicine man and the doctor were alike unable to reduce its virulence and powerless to stem its relentless infiltration among settlers and Indians. Inoculation against smallpox was introduced at Quebec in 1765. In 1802 vaccination was used for the first time in Canada at Liverpool, Nova Scotia. The Indians accepted it and gradually smallpox was brought under control. Another milestone was reached.

With the growth of Quebec a hospital became a necessity so in 1639 the Hôtel Dieu, was erected the second hospital in North America, Cortes having built one in Mexico in 1525. The Hôtel Dieu, Montreal, 1644, was the second such edifice in Canada. The Toronto General was constructed in 1820. It was not until 1872 that the first hospital in the west was built in Winnipeg. The public and doctors did not take kindly to these institutions for a long time. Even in 1889, there were only 0.91 beds per 1,000 of population in Canada. In 1946 this had increased to over 6 beds per 1,000.

Another milestone was passed when in 1750 Bigot introduced regulations for the examination of intending medical practitioners. His reasons are better given in his own words:

"From information we have received, it appears many unknown individuals coming from Europe and elsewhere have engaged in surgery as much in the cities as in the country districts, without any permission; that these strangers whose ability is unknown treat the sick with little care and without giving them relief; distribute worthless remedies which give unsatisfactory results, not having all the experience necessary, and leading as a final result to abuses which are prejudicial to the well-being of the subjects of the King; and to prevent the evil which the obstinacy of many through inexperience may cause we have decided to make the following regulation."

In 1758 a Medical Act was passed by the British Government regulating the practice of medicine and surgery in French Canada. A licensee would be granted only after an examination by some person designated by the Governor or Commander-in-chief. Fines were imposed for offenders who failed to take the examination or violated the provisions of the Act. It was not until 1795 that a similar Act was put into force in Upper Canada. Manitoba had its first licensing act in 1871, New Brunswick in 1881, British Columbia in 1886, and the North West Territories in 1888. The Dominion Medical Council did not come into being until 1911.

The medical histories of all the Provinces follow much the same pattern. First came the pioneer medical men with the early settlers. As the population grew epidemic disease required some form of regulation to prevent its

spread. Then hospitals were required. About this stage of development of the country unskilled practitioners and quacks had to be weeded out and so examining and licensing boards were set up. Following this medical societies and journals came into being. When greater growth of population took place medical schools to train suitable practitioners were organized. Lastly, research was established in these institutions. The history of medicine of Canada has followed this pattern. We have seen the first doctors arrive, quarantine introduced, hospitals built and regulations for medical practice set up.

Now one finds the founding of the first medical society. This was the Medical Society of Quebec. The first meeting was held in Quebec City in 1826. The membership seems to have been about equally divided between French and English practitioners. At the first regular meeting twelve papers were presented, six in French and six in English. In this year also the first medical journal in Canada appeared. This was published quarterly in both French and English. With increased facilities to discuss medical problems both verbally and in the medical press a stimulus was given the early physicians to investigate and report on matters of local and general interest and another milestone in Canadian medicine was reached.

The *Montreal Medical Gazette* was established in Montreal in 1845, the first entirely English publication in this country. Many journals followed in Montreal, the Maritimes and in Upper Canada. It was not until 1911 that the *Canadian Medical Association Journal*, formed by the union of the *Montreal Medical Journal* and the *Maritime Medical News*, came into existence.

Just after Confederation in 1867 the Canadian Medical Association was founded. Its early years were precarious. Eight years after its birth it came close to losing its identity and was saved only by the adverse vote of the judicial council of the American Medical Association. At that time it had less than 500 members and these were from the Eastern Provinces. There was no member from west of Lake Huron. Canadian medicine was striving to find its place as an independent unit on the continent when in 1875 a resolution was adopted at the annual meeting at Niagara which threatened its existence.

This resolution called for a union with the American Medical Association. The latter body at its next meeting was of the unanimous opinion "that a union of the two Associations into one is desirable". The judicial council of the American Association by its action in vetoing the matter saved the Canadian Association from absorption. Surely this was a milestone safely passed.

Canada was expanding. The Canadian Pacific Railway soon stretched to the far Pacific. Branches grew off the main line north and south. Rival railways opened up new territory and immigration was encouraged. The medical needs of the people called for more physicians. Montreal was fast outstripping Quebec in population, as a shipping port and in financial importance. Here in 1824 the staff of the Montreal General Hospital created the Montreal Medical Institution, the precursor of the Medical Faculty of McGill. In the same year at St. Thomas, Ontario, Dr. John Rolph commenced a course of lectures on Medicine. In 1830 Dr. Rolph opened a private medical school in Toronto which later became "The Toronto School of Medicine". In 1854 by arrangement with the Board of Victoria College the Toronto School became the Medical Department of that University. In 1850 the Upper Canada School of Medicine, newly formed, offered their services to Trinity College and so two medical schools carried on in Toronto until 1903 when the University of Toronto took over the Medical Faculty of Trinity.

Victoria University built at Cobourg in 1836 was in a curious position as regards medicine. As has been noted it took over the Toronto School of Medicine and granted degrees. From 1867 until 1890 it granted degrees to students of L'Ecole de Médecine et de Chirurgie de Montreal which had been established in 1843, but did not have degree granting privileges.

In 1847 there was in existence the "Incorporated School of Medicine of the City of Quebec". Queen's University established a Medical Faculty in 1854. Dalhousie offered a partial course in medicine in 1867 and was giving a complete medical education by 1872. The London Medical School was founded in 1881, Manitoba Medical School in 1883 and the Medical Faculty of the University of Alberta in 1913. The University of British Columbia and that of Saskatchewan are preparing to give complete medical instruction at the present time.

When the older medical schools were firmly established laboratories became better equipped and money became available for research work. Many valuable contributions were made by all the medical schools, but the greatest was the discovery of insulin and its development by Sir Frederick Banting and his associates, Professor McLeod, C. H. Best and Dr. J. B. Collip, in 1922. Canada too has given leaders in Medicine to other countries. Chief of these was Sir William Osler, first Professor of Medicine at Johns Hopkins and later Regius Professor of Medicine at Oxford. Dr. Arthur Ellis, now Regius Professor of Medicine at Oxford, was the second Canadian to occupy this post.

Many others attained high place in teaching and research work, particularly in the United States. Canadian Medicine was now, unfortunately for itself, exporting its talent.

With the outbreak of the first great war many Canadian physicians joined the Imperial forces or proceeded overseas as medical officers in the Canadian Army Medical Corps either attached to combatant units or with hospitals or Field Ambulances. During the second world war a greater number played their part both overseas and in many research laboratories at home.

With nine medical schools, graduating men equipped to deal with the type of work they are called on to perform, Canada has today taken a high place in world medicine. Looking back over the past, one can point with pride to the milestones which have marked its progress and be proud of the heritage which our forefathers in Canadian medicine have bequeathed to it, and look forward to a future of ever-expanding usefulness in the prevention and care of disease in the rapidly growing population of the Dominion.

210 Tegler Bldg.

MEDICAL ECONOMICS

Medical Services in Great Britain

[The following memorandum, somewhat condensed, has been received from the British Medical Association regarding the recent events in the medical services in Great Britain.—EDITOR.]

THE MEDICAL REVOLUTION IN GREAT BRITAIN

On July 5, 1948, medical practice in Great Britain was transformed from a mainly independent service into an official social service. Doctors and others throughout the world have watched with keen interest the fight of the British medical profession to preserve, in the changing scene, their ideas and traditions of freedom and service. The rapidity of events, however, during the last few months and the profession's acceptance of the new order in May after stout resistance in February have bewildered many onlookers from abroad, and it has been suggested that a concise account of what has happened would be appreciated.

THE DEVELOPMENT OF THE PROFESSION'S POLICY FROM 1911 TO JULY, 1942

The gradual development of the main principles for which the British Medical Association has stood in the recent dispute began with the National Health Insurance Act in 1911. The following principles were then evolved.

ASSOCIATION NOTES

INAUGURAL ADDRESS*

Wm. Magner, M.D.

Toronto, Ont.

It is with great pride that I stand before you as President of the Canadian Medical Association, but my pride springs only from a recognition of the dignity and the responsibility of this position. It has no tinge of complacency, as I know that I owe my selection to the kindness and the tolerance of my friends, rather than to any merits or achievements of my own. My first duty tonight is to express to the members of general council my sincere and humble thanks for the great honour they have done me.

Since our Victory Meeting in Banff, we have had two years of peace, albeit "a naked poor and mangled peace", a peace without order or stability. The clash of arms has been followed by a clash of ideologies, by a war of nerves, a bitter and portentous war. This is a struggle to confine the slime of communism, which in broad and fetid streams or in malodorous trickles seeps through the countries of the world, sickening the souls of men.

Communism is more than an economic plan. It is more than a great political power. It is a materialistic and ruthless philosophy. It is a heathen cult which "fills a vacuum left by the decay of faith". It thrives only under conditions of misery and insecurity, and it must be combated on a global scale by measures directed towards the spiritual and material redemption of the distressed peoples of the earth. The answer to communism, says Egon, "is security with liberty rather than at the price of liberty, bread with freedom rather than at the price of freedom". This is the answer, and reluctantly we must now agree that economic aid to the war-shattered nations, unbacked by military power to protect their independence, will not arrest communist infiltration. Our hope, our confident hope, that the old world will be rescued from the despotic rule of a victorious totalitarian state, that we ourselves will escape ultimate abasement and slavery, lies chiefly in the power, the vision and the political acumen of our freedom-loving neighbour, the United States of America. Now, among the nations of a worn world, it alone has the material resources to fight the cold war successfully. It alone has the military might to call halt to Soviet aggression.

It is only when freed from the baneful influence of communism, that we may look for a return of "gentle peace . . . (to) . . . bless us with her former qualities". But true and lasting

peace demands more than neutralization of this evil. It will not be ensured by treaties, which before now have become scraps of paper. It requires a change in the hearts of men, an awakening of the human conscience, and adherence to the teachings of Christ. We must seek a final solution of world problems, terrifying in their complexity, through individuals and not through governments. We must destroy national fanaticism. We must replace racial and class hatreds by "collaboration, concord and peaceful work".

Banded into a great fraternity which knows no barriers of race or creed, dedicated to the relief of human suffering, and to the betterment of the physical and mental health of the people, respected and influential in their communities, doctors, as individuals and through medical associations can play a great part in the building of a new world. This opportunity, this responsibility, has been recognized. Assembled in Paris, last September, delegates from forty-eight nations formed the World Medical Association: a voluntary alliance pledged to the promotion of the health of all the peoples, and to the promotion of world peace. Any doubts as to the potential influence of this guild in the furtherance of international understanding, the palliation of human misery, and the consequent frustration of communism, should be dispelled by the absence of the arch-disturber, Russia, from the Paris conference, and by the attempt to wreck the conference which was made by unavowed minions of the Kremlin. We are indeed proud that one of our own, one who is peculiarly our own, T. C. Routley, has played a leading part in the moulding and launching of the World Medical Association, and that he is now chairman of its executive council. Tonight, in recognition of Dr. Routley's service to humanity in this connection, you have presented him with the Starr medal.

Side by side with the voluntary body, the World Medical Association, we now have the World Health Organization, formed and supported by the governments of the United Nations. We cannot "look into the seeds of time and say which grains will grow and which will not", but I believe that the Canadian Medical Association and the Government of Canada have acted most wisely in lending full support to these great humanitarian ventures.

With the full knowledge that it will be many years, and perhaps even many centuries, before the earth becomes in truth one world, ruled by justice and charity; realizing that we must remain vigilant and armed against outside aggression, while facing the stern challenges presented by grave defects in our own body social; we must struggle against discouragement, against a sense of our own futility. We must hold fast to faith in man's high destiny. We must believe, with Dr. Noisy, that today he stands "between the past

* Read at the Seventy-ninth Annual Meeting of the Association, Toronto, June 23, 1948.

heavily weighed down with memories of the beast, and the future rich in higher promise". We are told that it is a million years since primitive man appeared upon the earth. A lifetime, a century, is as a moment in the development of the great pageantry of the human race. In the troubled years ahead, we must each play his part, with confidence that in God's time good will prevail over evil, and peace and beauty will return to the world. "The day is short and the work is great. The reward also is great and the Master praises. It is not incumbent upon thee to complete the work but thou must not therefore cease from it."

Proceedings of General Council for the 79th Annual Meeting, Toronto, June 21 to 25, 1948

The following summary deals with the proceedings of Council at the Annual Meeting of the Association in 1948. Full details of reports are being prepared in reprint form and may be had on application by any member of the Association.

In general it may be said that in all respects the meeting was completely successful. The attendance at Council was 125, out of a possible 143, the largest number yet recorded, and the total attendance at the meeting reached the record proportions of 2,024 doctors and 309 ladies. The program was unusually full and of a very high technical order. Scientific exhibits were again on display after a long interval during which they had not appeared. The commercial exhibits were also well selected and of great interest.

The Chairman of Council, Dr. Harris McPhedran, reviewed the work of the Association for the past year.

The Annual Meeting for 1949 is to be held in Saskatoon, in the week of June 13, with the following proposed future dates:

1949 — Saskatoon	1954 — Vancouver
1950 — Halifax	1955 — Montreal
1951 — Montreal	1956 — Winnipeg
1952 — Alberta	1957 — Toronto
1953 — Ottawa	

These suggestions are recommended only after the most careful consideration and will in all cases be subject to the approval of the Divisions.

Membership of the Association has shown an increase of paid members of 1,826 (as of May 6) to reach a total of 8,502. It is gratifying that more than 73% of the returned medical officers have paid their fees this year, after completion of the complimentary membership extended to them. Attention was drawn to the fact that whilst undergraduate students were ineligible for ordinary membership their potentialities for future members were so im-

portant that CAMSI had been authorized to enroll as subscribers to the *Journal* at a reduced rate as many students as possible. There are about 908 such student subscribers at the moment. It has also been arranged to accept medical officers with permanent commissions in the Services as members-at-large. Continual efforts are being made to add to our membership those who at present do not belong to our organization.

It was shown by the Managing Editor that the circulation of the *Journal* was roughly 3,000 more than the number of paid-up members. This is due to subscription from libraries, hospitals, doctors residing outside of Canada and students.

TREASURER'S REPORT

The Honorary Treasurer's report showed the following.

REVENUES AND EXPENDITURES

"Our revenue for the year 1947 reached the record figure of \$153,790.80, almost \$14,000.00 above that of the preceding year. This increase comes from higher revenues from membership fees, subscriptions and advertising. The expenditure, however, increased by some \$23,500.00. Approximately \$17,000.00 of this is the increased cost of printing the *Journal*; the rest is increased operating costs. The net result of these increases is that a surplus of some \$8,000.00 in 1946 has been replaced by a deficit of \$1,411.22 for the year 1947."

BUDGET COMMITTEE

The Executive Committee, at its October meeting, passed a resolution that all expenditures, which did not fall within the Annual Budget, must be studied and approved by a Budget Committee before they could be carried into effect. In this way it is hoped that there may be closer control of the expenditure of the funds of the Association.

INVESTMENTS

Our investments continue to be supervised by The Royal Trust Co., our financial advisers.

MEDICAL ECONOMICS

The Committee on Economics presented the following report.

Six meetings of the nucleus of the Committee on Economics have been held in Toronto and a full report of all business has been transmitted to each of the Divisional members of the Committee.

Your committee this year has confined its deliberations largely to the study of compulsory health insurance. We did so feeling that the experience of the medical profession in some countries warranted us in being as fully prepared as possible to adopt a positive attitude toward governments in any proposals they might make to extend compulsory health services. We feel that clarifying our own attitude as fully as possible to government sponsored health insurance has many advantages over watchful waiting.

We recognize that all political parties in Canada have approved of health insurance as a means of providing medical services, that several provinces have already enacted legislation and that the Government of Canada has made very specific proposals to the provinces relative to health insurance. Moreover, it is noted that increased

expenditures are provided this year in the Departmental budget under the heading, "Health Insurance Studies".

The relationship of the Canadian Medical Association to previous Federal considerations of Health Insurance has been defined and is well known. General Council in May 1944 adopted as its own 18 Principles relating to Health Insurance, the first one of which states: "The Canadian Medical Association approves the adoption of the principle of contributory Health Insurance, and favours a plan which will secure the development and provision of the highest standards of health services, preventive and curative, provided the plan be fair both to the insured and to those rendering the service."

Your committee decided to proceed to a study of all available plans and enactments respecting government sponsored health insurance, using the Principles as the yardstick by which to measure them. In this manner an analysis was made of A Draft for a Health Insurance Act, Canada, popularly known as the Heagerty Bill. A similar study was made of the Murray-Wagner-Dingell Bill of the United States and of the Swift Current experiment in Saskatchewan.

The restlessness of the Canadian people in their searchings for better health requires that we as doctors do not sit around and wait for something better to happen. We concur in the report of our Assistant Secretary, Dr. A. D. Kelly, when he writes of the Swift Current experiment: "An observer gathers the impression that here is a successful experiment in the large-scale provision of medical care, courageously applied, efficiently managed and remarkably free from attempts to make the facts fit preconceived ideas, financial and otherwise".

The provision of complete medical care is so complex that we should encourage other experiments where local conditions are different. These should be thoroughly studied and their lessons assimilated before being copied.

As no official link existed between the Association and the Department of National Health and Welfare, it was suggested to our Executive Committee that they offer to appoint a small committee to advise the Department of National Health and Welfare on matters relative to Health Insurance and that the advice of this committee be available on a provincial level on request of the divisions. This was done. The committee consists of the Chairman of the Committee on Economics, the Consultant in Medical Economies, the General Secretary, and the Assistant Secretary.

The Department of National Health and Welfare accepted the offer regarding the establishment of such a committee. In February, Dr. T. C. Routley, in conference with the Hon. Paul Martin, Minister of National Health and Welfare, and his Deputy Minister, Dr. G. D. W. Camerou, was informed that considerable attention was being given to problems relating to social security, and more particularly to health insurance. The Minister felt that the time had arrived when a useful purpose would be served if officers and members of his department sat down with a representative group from the Canadian Medical Association to have a look at certain proposals.

To this end your advisory committee in March discussed these proposals with the Minister and his advisers. This discussion was informal and exploratory. It was a mere past of what they were thinking and was not a discussion of any bill or bills. However, the Minister was emphatic in stating that the pressure politically for health insurance was very great; that monies spent only for studies and planning would be considered quite inadequate. He felt that there was a growing restlessness in the country that something be done to meet the demands for better health for Canadians. He felt that health insurance should be implemented in stages and that the first stage could be realized by grants in aid.

It will be recalled that in 1945 the Federal Government suggested to the provinces that they should undertake a survey of their health needs and the offer of a grant for Planning and Organization was made. At that time it was intended that the outcome of this

period of planning and organization should be an acceptable plan for the introduction of Health Insurance in progressive stages. Present Departmental thinking envisages a study of the whole field of health by the provinces according to a master plan, but does not undertake to limit the recommendations which may emerge. Your committee is heartily in favour of such study being undertaken and, if the funds become available, it is urged that each Division participate to the fullest extent in order that the provincial plaus may reflect the composite opinion of the doctors.

Additional Health Grants are under consideration for general public health, venereal disease, and possibly for cancer and hospital construction. Viewing the health of Canadians from the Atlantic to the Pacific we find in 1946 that the infant mortality rate in one province was 35 and in another it was 66 per 1,000 live births. We find that neo-natal mortality varied from 16 per 1,000 live births in one province to a rate of 35 in another province. The percentage of live births occurring in hospitals and other institutions to the total occurring in the province varied from 35.6 to 95%, depending on the province. With such varied medical facilities, we must consider that health grants have much merit as a means for improving health services. They seem to be a reasonable method of attempting to build from the basement upward rather than from the roof downward.

It must be emphasized that in our discussions with the Department of National Health and Welfare it was repeatedly pointed out that the plans under consideration do not necessarily represent Governmental policy. They may be accepted and implemented, they may be materially modified, or they may be abandoned. It is a matter of satisfaction that we are consulted at this stage of Departmental planning, since it is before policies have become fixed that discussions are mutually advantageous. It is our hope that the medical profession will continue to merit the confidence of government and in order so to participate we must be constructive in our recommendations.

We are informed that the Department of National Health and Welfare considers that Health grants such as these may be thought of as instalments of Health Insurance, and will be designed to fit eventually into a scheme of health insurance by providing a minimum standard of essential health services in Canada. Also, they aim at making it possible to give free treatment for all persons within the province suffering from tuberculosis, mental disease, and venereal disease. This brings into focus some feature perhaps we should look at.

Millions of dollars added to various departments of health will make these departments very strong and influential. Where does the private practitioner, be he specialist, consultant, surgeon or general practitioner, fit into the picture? For the moment may we consider only one of these groups, namely the general practitioner. If treatment is to be free in clinics, it is going to be very difficult for general practitioners to do their legitimate share of this work unless his services also are free to the patient. In other words payment for the general practitioner must be assured just as is the payment of the workers in the department and clinics in the same field and from the same fund. We commend for your consideration the principle that monies made available to Health Department be available to all workers in these fields whether they be private practitioners or departmental employees, and that these services be so planned.

A way of life that develops institutions tending to progress along impersonal lines and setting their own arbitrary standards is in danger of neglecting individual development and personal excellence. We suggest that more doctors interest themselves in and inform themselves on compulsory Health Insurance. A greater emphasis should be laid on Medical Economies as a suitable subject for addresses and discussions at medical meetings at all levels. If and when various health insurance instalments confront us we will be in urgent

need of having a large body of medical men who can think as doctors and as citizens with equal facility. Along this way lies our best hope of achieving what is best for ourselves and for the Canadian people.

Attention was drawn also to the announcement made by the Government of Canada regarding grants to the Provinces for the extension of health services. These would be on the following basis.

1. Health Survey Grant (formerly called Grant for planning and Organization)—\$5,000 basic grant to each province, plus 5 cents per capita of 1941 population; total to any province to be not less than \$15,000. The Prime Minister made it clear that this grant is not conditional on the Provinces undertaking to enter a health insurance plan. Total amount of this non-recurring grant is \$625,000.

2. General Public Health Grant—35 cents per capita, increasing in succeeding years to a maximum of 50 cents per capita. Provinces must undertake at least to maintain their expenditures in this field at the present level. Initial total grant \$4,404,000 per year.

3. Tuberculosis Control Grant—\$25,000 basic grant to each province, the remainder to be calculated 50% on the basis of population and 50% according to the average number of deaths from tuberculosis over the previous five years. Initial annual grant \$3,000,000 rising over a period of years to \$4,000,000.

4. Mental Health Grant—\$25,000 basic grant to each province, the remainder distributed according to population. Initial annual grant \$4,000,000 rising over a period of years to a maximum of \$7,000,000.

5. Venereal Disease Control Grant—\$500,000 annually. Current grants of \$225,000 are being made to the provinces for this purpose. The new proposal increases this grant by \$275,000.

6. Crippled Children's Grant.—To assist the Provinces in developing a program for the prevention, control and treatment of crippling conditions in children, a grant of \$500,000 annual is made, to be divided on the basis of population.

7. Professional Training Grant.—In order to meet the need for larger numbers of professional personnel in the public health and related health fields, the Dominion will make available to the Provinces \$500,000 annually. This amount is twice that originally proposed in 1945.

8. Public Health Research Grant—\$100,000 initial annual grant to be increased by \$100,000 annually to a maximum of \$500,000.

9. Cancer Control Grant—\$3,500,000 maximum to the Provinces. The Dominion will contribute on an equal share basis the cost of any approved program for the control or treatment of cancer which the Provinces may undertake, otherwise on a per capita basis. This is a new grant not mentioned in the 1945 proposals and the details of its distribution have not been made entirely clear.

10. Hospital Construction Grant.—In the 1945 proposals, low interest loans to the Provinces were mentioned as an aid to the construction of hospitals. The Government of Canada now offers grants to the Provinces on the following basis: \$1,000 per active treatment bed; and \$1,500 per chronic or convalescent bed. One condition which it is proposed to attach to the hospital construction grants is that the Province shall match the Dominion contribution or better it, and that the Dominion contribution shall not in any case exceed one-third of the total cost per bed in any project. It is estimated that the Dominion contribution under this heading will amount to \$13,000,000 annually for the next five years.

It is estimated that the total Federal expenditure in respect of the above grants will be \$30,000,000 per year for the next five years.

It may be said in passing that this report was adopted unanimously. The whole subject of medical economies is under continual study by the Committee, as may be seen by this very thorough report.

PREPAID MEDICAL CARE PLANS

This subject, which is very intimately bound up with medical economics, is that of prepaid medical care plans. A committee to study this matter has been working for the last year and consists of six members of the Canadian Medical Association resident in British Columbia, and a professional member from each of the seven existing medically sponsored voluntary care plans in Canada. The Committee met three times during the year, and on February 6 and 7 held a two-day conference at which Mr. F. E. Smith, of Associated Medical Care Plans, and Dr. G. D. Leitch, of Portland, Oregon, were present.

A very full discussion took place on the report of this committee, and it was felt necessary at one stage to obtain the advice of our solicitors. It was finally agreed that the following recommendations should be approved.

"1. Whereas this Executive Committee has indicated its approval of the formation of a Federal Corporation to co-ordinate activities of medically controlled plans of voluntary prepaid medical care operating with the approval of the organized medical profession in the Canadian provinces; and whereas the launching of this corporation is a matter of interest to the whole medical profession; Therefore be it resolved that Doctor A, Doctor B and Doctor C be authorized to communicate with the Divisions to determine those plans operating in their area with the approval of the Division, and to invite one representative from each of these designated plans to assemble for the purpose of applying for the above mentioned Federal charter.

2. Your sub-committee would further recommend that the persons designated by the Canadian Medical Association to convene the conference of the Plans be Dr. L. H. Leeson, Dr. C. C. White and Dr. A. E. Archer."

Following the approval of the above recommendations by General Council, some further discussion took place on the advisability of the Canadian Medical Association being represented on the new corporation by members nominated by this Association. This matter was clarified by the following resolution of General Council, moved by Dr. White, seconded by Dr. Magner.

"That this Council approve the principle that the C.M.A. shall be represented on the new corporation to correlate medically controlled plans of prepaid medical care; and that the constitution of the new corporation be so written as to permit the nomination of members of the corporation by the C.M.A."

INCOME TAX

In a Supplementary Report to the section on income tax in the Report of the Executive Committee, Dr. Routley reported for the Special Negotiating Committee the results of an interview held on June 14 with the Honourable

Douglas Abbott, and with Mr. Scully, Deputy Minister for Taxation, Department of National Revenue. He stated that two main proposals were put forward: (a) A request that doctors be permitted to deduct the expenses of attending certain medical meetings; and (b) that salaried physicians be permitted to deduct certain professional expenses.

In respect of the first proposal the following letter had been received from Mr. T. W. Bullock, Director General Individual Assessments Branch, Department of National Revenue:

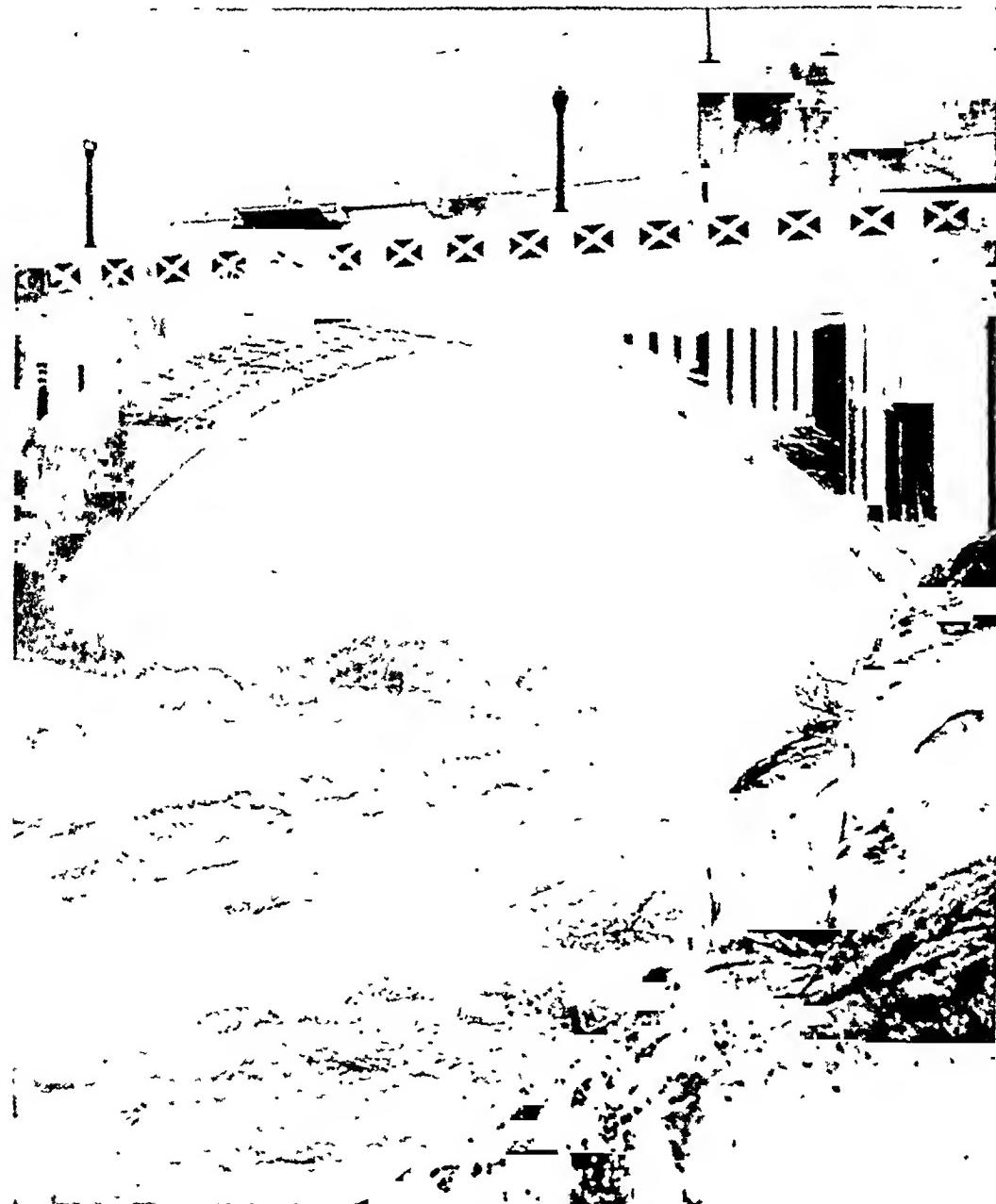
"With reference to the discussion had with you and your colleagues on the 14th instant, this will advise

you that the Department will give favourable consideration to some of your requests, commencing with the year 1948. A Directive setting forth the conditions under which reasonable expenses incurred by doctors in attending certain conventions of the Medical Associations will be allowed for income tax purposes, is being prepared and will be issued in due course.

This preliminary indication is being given to you in view of your request to be advised by June 21 of the attitude of the Department towards your submission."

In respect of our requests on behalf of salaried physicians, it was made perfectly clear that the new Income Tax Act established beyond question that the salaries of all taxpayers were to be regarded as net income and not subject to deductions for expenses of any kind. It was

Canadian Physicians' Fine Art and Camera Salon



"Les Grandes Eaux". By Dr. Dominique Gaudry, Chicoutimi, Que. One of the prize winning photographs exhibited at the Fourth Annual Fine Art and Camera Salon, Toronto, 1948. Sponsored by Messrs. Frank Horner Ltd., Montreal.

pointed out, however, that salaried doctors might arrange with their employers to have certain reasonable expenses paid by the employer over and above salary as part of the terms of employment.

GENERAL PRACTITIONERS

An active and interesting discussion on the status of the General Practitioner took place both in relation to the reference to this matter in the report of the Executive Committee and in relation to the report of the Committee on Medical Education. A largely-attended meeting of general practitioners was held on Wednesday, July 23, at which it was decided to request that the Canadian Medical Association bring about the necessary changes in its By-Laws to embrace a General Practitioner Section and that these changes should allow the Section the necessary freedom to form its own executive and to allow freedom of action in education, standards of recognition, etc. General Council had previously approved a resolution to examine the advisability of so reconstituting the scientific sections as to make them meet the needs of the profession as a whole and to consider methods of bringing about greater cohesion between the various medical groups of the Canadian Medical Association.

MEDICAL SOCIETIES

Ontario Medical Association

Five life memberships were granted at the Annual Ontario Medical Association meeting. These are the citations: Malcolm Hectorson Valentine Cameron, M.B. (Tor.) 1903, has taught at the University of Toronto for over forty years, has kept up to date on current medical literature, has been a member of the Board of Directors of the O.M.A. and for many years a member of the Council of the Ontario College of Physicians and Surgeons, is a past president of Council, is medical correspondent for Ontario to the *Canadian Medical Association Journal*, is Canadian correspondent to *The Lancet*, an outstanding student.

John Allen Oille, M.B. (Tor.) 1903, M.D. (Tor.) 1904, has practised in Northern Ontario and in Toronto where he has been on the University faculty for many years, has taken an active part in postgraduate lectures to the practitioners throughout the province, was an active member of the O.M.A. committee for the study of prepaid medical care, has continued his interest as a member of the Board of Governors of Physicians' Services Incorporated.

John Shehan, M.B. (Tor.) 1895, has practised in St. Catharines since 1896, has been a member of the Board of Directors of the O.M.A., a member of the Council of the College of Physicians and Surgeons, represents the Council on the Senate of University of Toronto, is past president of the Board of Governors of Niagara Peninsula Sanatorium.

Graham Laughlin MacDougall, B.A. 1899, M.B. (Tor.) 1910, has been a member of the Board of Directors of O.M.A. and of the Council of the College of Physicians and Surgeons, of which he has been president, recipient of the Brydon Award for outstanding medical service.

John William Cook, M.B. (Tor.) 1903, has practised in Fort William more than forty years, could always be relied on to make a call on any type of patient in the surrounding district, is an ardent fisherman, has served as president of Thunder Bay Medical Society.

Federation of Medical Women of Canada

The Federation of Medical Women of Canada, held their annual meeting in Toronto in June. The officers elected are: Honorary President, Dr. Margaret Cameron Gosse, Halifax; President, Dr. Anna Nicholson, Saskatoon; Vice-presidents, Dr. Pearl Hopgood, Nova Scotia; Dr. Cora Eaton, New Brunswick; Dr. Eleanor McKenzie, Quebec; Dr. Phyllis Bradshaw, Ontario; Dr. Kay Borthwick Leslie, Manitoba; Dr. Margaret Chase Collins, Alberta; Dr. Margaret Sylling, British Columbia; Secretary, Dr. Emma Adamson, Winnipeg; Treasurer, Dr. Margaret Owens, Winnipeg; Corresponding Secretary, Dr. Anna Wilson, Winnipeg; committee conveners; archives, Dr. Mary Eddis, Toronto; scholarship, Dr. Marion Hilliard, Toronto, Dr. Jessie McGeachy, Winnipeg and Dr. Grace Donnelly, Montreal; opportunities for medical women, Dr. Jessie Gray, Toronto, Dr. Ethlyn Trapp, Vancouver and Dr. Isobel Wright, Montreal; cancer committee, Dr. Helen Millburn, Toronto and Dr. Lola McLatchie, Calgary; overseas committee, Dr. Edna Guest, Toronto and Dr. Ellen Douglas, Winnipeg; counsellors, Dr. Ellen Taylor, Winnipeg and Dr. Lillian Chase, Toronto.

During the C.M.A. meeting donations were collected for food for medical colleagues in Britain; the committee, convened by Dr. Hollie McKinnon, Toronto, sent forty-six parcels. Continuation of the overseas committee until 1950 was agreed on, this committee raises money to be sent to the British Federation of Medical Women for the purpose of giving medical education to the daughters of war victims.

Dr. Agnes Moffatt, Peterborough, past president compiled a directory of Canadian medical women. Of the five hundred women physicians registered in Canada one hundred are certified specialists.

New Brunswick Medical Society

At a largely attended special session of the executive committee of the New Brunswick Medical Society, held in St. John, July 21, the diagnosis, rare and treatment of cancer was exhaustively discussed. Emphasis was laid on a possible new Provincial set up. In addition to the members of executive committee Dr. D. F. W. Porter, director of hospital services, and Dr. J. R. Nugent, Dr. R. A. H. MacKeen and Dr. A. S. Kirkland were invited to further the discussion. Dr. D. A. Thompson, President, of Bathurst, was chairman.

CANADIAN ARMED FORCES

News of the Medical Services

The arrival of *H.M.C.S. Athabaskan* in Esquimalt, B.C. on June 29, 1948 was marred by the death at sea of a crew member on the previous day from anterior poliomyelitis of the bulbar type. The *Athabaskan* was completing a voyage from Halifax, N.S., via the Panama Canal. During the period from June 29 to July 2, 1948 eleven suspicious cases were removed from the ship, of which seven were subsequently hospitalized. The ship was placed in quarantine until July 14 and, fortunately, no new cases developed.

Representatives from the Medical Services of the Navy, Army and Air Force spent two very profitable weeks (June 13 to 27), in Toronto, where they attended three conferences of great interest to the Services.

The first conference was on "The Influence of Cold Environments on Man", and was attended by investigators from the United Kingdom, United States and Canada. The discussion dealt with the physiological factors of wet and dry cold, nutritional factors and psychological factors. These discussions went far toward pointing out the gaps in the present day knowledge of the subject and in organizing an approach to study. The second conference was the annual meeting of the Aero-Medical Association, which dealt with various problems of Aviation Medicine. This conference was exceptionally well organized, and a tremendous number of problems were discussed. No less than sixteen countries had representatives at this Conference. The Aero-Medical Association, and in particular the Canadian Committee, is to be congratulated upon the success of the meeting. The third conference was the 79th Annual Meeting of the Canadian Medical Association. This meeting was not only enlightening and interesting from a scientific and professional viewpoint but proved to be one of the greatest get-togethers for the profession since the inception of the Association. Somewhat more than 2,000 doctors registered.

The Medical Services of the Armed Forces formed a panel of the Canadian Medical Association and had a very successful and well attended meeting on the afternoon of June 25, 1948. Colonel K. A. Hunter, was Chairman of the meeting and Brigadier H. M. Elder was Chairman of the Panel discussion. The following interesting papers were given: Lieut.-Col. J. N. Crawford, Medical Aspects of Arctic Warfare. W/C. W. R. Franks, Some Aspects of Atomic Warfare. Colonel M. Brown, Bacterial Warfare. Dr. O. Solandt, General Research Problems.

The M.D.G. (Navy), D.G.M.S. (Army) and D.H.S. (Air) outlined the organization and administration of their respective Services.

The post-war training of medical officers is proceeding along professional and military lines with the ultimate objective of having every officer of the R.C.A.M.C. certified as a specialist or a graduate of the Canadian Staff or National Defense College. One medical officer successfully completed his staff training in 1947 and five other officers were successful in the preparatory course this year. On the professional side, the R.C.A.M.C. already has a number of officers who possess a diploma in public health. Others have been certified as specialists in surgery, medicine or anaesthesia by the Royal College of Physicians and Surgeons of Canada. At the present time, two officers are preparing for the qualification of D.P.H., and three are preparing to write the next examination for Fellowship in the Royal College.

Full use is made of the clinical training opportunities which are offered in D.V.A. Hospitals, particularly Queen Mary's Hospital in Montreal. In addition, two assistant residencies, one in medicine and one in surgery, are held by R.C.A.M.C. officers in the 2,500 bed U.S. Military Hospital at Fort Sam Houston, Texas. The integration of Toronto Military Hospital with Sunnybrook Veterans' Hospital in Toronto, which is scheduled for next autumn, will provide further splendid opportunities for training in Canada.

In an effort to introduce medical officers to the elementary aspects of the medical effects of atomic warfare, 50 officers of the Corps will attend the five day course given by the U.S. Army School of Postgraduate Medicine commencing in September. In addition, a pamphlet on this subject is now printed for circulation to all serving Officers in the Medical Services of the Armed Forces. The civilian applications of this knowledge will be of some importance. The necessity of maintaining the highest standards of professional work in the Corps is recognized not only as a means of ensuring the best possible treatment for Army personnel, but also in order to maintain that vital liaison with the profession and attract the proper type of young doctor into the Service.

S/L. E. C. R. Purchase has been appointed as Senior Medical Officer, R.C.A.F. Station, Greenwood, Nova Scotia.

S/L. H. R. Mack has taken up a position as Staff Medical Officer, R.C.A.F. Station Hospital, Rockcliffe.

S/L. J. D. Munroe was posted as Senior Medical Officer, R.C.A.F. Station, Edmonton.

A survey was completed during the summer months of R.C.A.F. Units to determine which required anti-mosquito control measures, particularly in connection with aircraft spraying of ground areas. A full program of control measures will be carried out at the appropriate time early in 1949. This survey was carried out by the R.C.A.F. Medical Branch in conjunction with the Defence Research Board.

Fifty-four undergraduates were employed by the R.C.A.F. Medical Branch during the summer months. These students were employed with the developmental research projects which are being carried out within the R.C.A.F.

A survey has been instituted of the peacetime physical requirements of each R.C.A.F. trade. The R.C.A.F. Medical Branch is publishing this in the form of an interim report for the immediate use of medical officers who are examining R.C.A.F. personnel.

Defence Medical Association of Canada

The next annual meeting of the Defence Medical Association will be held in the Chateau Laurier, Ottawa, on Thursday and Friday, November 5 and 6, 1948. All members of the twelve branches across the country are most cordially invited to attend. Information about the Association may be obtained from the Branch Secretaries, Command and Area Medical Officers of the three Armed Services, or the Honorary Secretary-Treasurer.

CORRESPONDENCE

Planning in Health Insurance

To the Editor:

May I congratulate you upon the very able and forceful editorial of July, 1948, on Health Insurance. Far too often even amongst the profession here the attitude towards the steadily rising cost of state hospitalization is that as soon as the chronies are cleared up the rising incidence of hospitalization will cease. You could not have more forcibly pointed out how wrong this attitude was. I was very impressed with "whatever medical activity we plot against time we find the same result, acceleration towards infinity".*

May I draw your attention to an interview with Sir Charles Herens, Dean of Medicine and for 25 years Professor of Public Health at Dunedin, New Zealand, as reported by Miss Isabel Atkinson. In the interview Sir Charles stated that "New Zealand's health insurance has been a dreadful mistake". It had put medical practice back to the 19th century. He stated that people were encouraged to consult doctors too often and for the wrong things.

Recently, just three days before the Saskatchewan election a Provincial psychiatrist, resident in Canada

* The phrase belongs to Dr. Ffrangcon Roberts, of London, Eng.—[EDITOR].

less than a year and formerly practising in New Zealand, created a local furore when he stated in an address his scientific opinion that New Zealand's health insurance had resulted in the development of a race of hypochondriacs there. The *Health Insurance Bulletin* has recently pointed out that the cost of the tenth year there is 167% of the ninth.

There seems to be only one common denominator to experiences with state-operated health insurance. It is that the moment the state takes over psychical factors enter that completely change the previous picture that existed in a democracy. I cannot but feel that plans formulated upon social and psychiatric knowledge of fifty years ago and whose basic form has not been changed in conformity with the more recent established knowledge in psychiatry and psychology are both unscientific and harmful. Weiss, in *Psychosomatic Medicine*, has stated that one-third of all illnesses for which the patient in the U.S.A. consults the doctor are purely emotional in origin; one-third, with the emotional factors activating the onset of symptoms; and one-third more or less purely organic. Others have estimated that the emotional factor is the most important in over half of all cases. Flanders Dunbar and others are pointing out that upon the patient's personality which results from his childhood experiences the type of disease he will suffer from depends. We all know the importance of the emotional factor in chorea, cardiovascular disease, gastric ulcer, hyperthyroidism, etc. J. H. Couch in the July issue of this *Journal* in writing on Plastic Surgery which not so long ago used to be considered a purely mechanical art, says: "It is easy to transfer skin from the thigh to the hand or from the arm to the face, and have a 100% take. It is not so easy to restore the (surgically healed) patient to his place in the social or economic world". It is the psychological factor that has been overlooked in establishing the form of aid used in health insurance. It is the method used to bring medical aid that is important.

Why is the method important? Simply because, according to our Saskatchewan psychiatrist and to what Sir Charles Hercus is reported to have said, when the method used to bring aid is that of health insurance and a survey is made a few years later of the reasons for the visit to the doctor, in place of the formerly one-third of cases being purely emotional in origin that third then existing has become one-half; in a few years more, three-quarters; in a further few years, five-sixths; and so "the acceleration towards infinity". At the same time as the purely functional cases increase, the other previous third of only partly emotional origin also have increased in number. It is then even more difficult to completely heal Dr. Couch's originally considered purely organic plastic case and his personality.

There is an answer to this situation that is each month becoming more apparent. It is that the method used in bringing medical aid be such that emotional maturity—the ability to stand upon one's own two feet and face the storms of life, medical included, alone efficiently—he increased, not diminished as health insurance diminishes maturity. Medical aid, as your editorial suggests, must conform to the laws of economics, but it must also conform to the laws of psychology if the aid is to improve the emotional maturity of the race, and of the profession. For if there is a steady acceleration in the use of x-rays, etc., which are medically unnecessary, is this due to increasing ability of the medical profession to stand on its own two feet of clinical knowledge and clinical experience which we all agree is the basis of good practice—professional emotional maturity—or the opposite?

There are several points further that should be emphasized. Experience has proved that on a nationwide scale the economic form aid should take is that of a cash allowance rather than that of handing out the goods and services. Of most importance is it that the plan of aid should at least make the attempt to

re-establish the recipient in a position where aid is no longer necessary. The basis of judging the amount of success the modern sociologist is having with his aid plan is whether or not the plan is improving the ability of the recipient to meet the storms of life alone successfully and the extent to which he in a given time needs less aid not more. Various extraneous factors, such as a rising cost of living, or a rising tide of unemployment greatly influence this result without changing the basic principle.

Medical aid should not vary in form from proved successful forms of aid for other fields of endeavour. It is only when the very existence of the profession and the treatment agencies are threatened by the form of aid used that they have any moral rights peculiar to them and different from those possessed by the ordinary citizen, just as the grocer has undisputed right to criticize the price a grocery aid plan will pay for groceries.

The essence of any plan of aid, medical included, if it is to aim at re-establishment of the recipient of aid is that this be the aim of the plan, and not that the aim be to continuously increase its scope and objects thus continuously making the recipient more and more dependent upon the aid. I sometimes think that those who advocate health insurance really basically would like to see every form of activity upon the same basis, a basis in which each citizen leans more and more upon the state.

A most important part of a successful plan of aid seems to be that it give aid in proportion to need, and that this is most successful when the form of the plan does it automatically without the necessity of administrative interference, and when equally automatically without administrative interference the aid is proportionately withdrawn as it is no longer needed. In other words, the plan must in its form encourage emotional maturity. There is only one nation-wide plan similar to this in Canada today. It is working so smoothly that it is accepted without murmur. That plan is Family Allowances.

Personally, when it became apparent that the principle of "acceleration towards infinity" applied to the Saskatchewan Hospitalization plan, I had felt that changing this plan so that it more nearly conformed to insurance principles by having the patient responsible for the first part of each account might correct in entirety this "acceleration towards infinity". However, in New Zealand apparently this is more or less already in effect, and the health insurance plan there according to their eminent authority is a "dreadful mistake".

Two years ago I suggested that our medical aid plan be based upon family allowances principles, in the form of sickness allowances. Last year, when asked to write upon family allowances in *Health* I tried to emphasize that the important thing about family allowances was that they blazed a new trail in social experiments because they incorporated the principle of automatically encouraging the recipient to stand upon her own two feet without administrative interference. I pointed out how so many of our income groups who were most in need of aid were using family allowances to buy their prepaid care. Visit any office of any prepayment of fees organization and one still finds that that office usually cashes more family allowance cheques than any other office in town, and the first part of the cheque goes for sickness protection.

Again, sir, I appeal that serious study be made of this form of aid. It is the only form in which costs do not "accelerate towards infinity"; in which emotional maturity is improved; in which breaking and explosive Dominion-Provincial relations play no part; in which doctors and treatment agencies are encouraged to manage their own peculiar business and not become for a few days each year socio-economic experts (a part they are unsuited for by tradition and training). Above all it is the only plan so far suggested which does

promise success. Again may I plead that the psychic factor be not disastrously ignored as it has been to date.

GRIFFITH BINNING, M.B.

P.S.—Why not bring over Sir Charles Hereus? He is New Zealand's authority on Public Health. Let us hear what he as a trained public health expert has to say about their ten years' experience.

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

THE NEW ERA

Superficially the first month of the new health service has passed uneventfully; not because it is working particularly smoothly, but simply because of the Englishman's innate gift of making the best of a bad job. Fortunately there are no epidemics at the moment, but even so general practitioners' surgeries are crowded. Pharmacists are working overtime trying to keep pace with the mass of prescriptions flooding their shops. Hospital staffs are carrying on as usual, pending a final decision as to the scale of salaries to be paid to consultants. Surgeons are finding relaxation in studying the Ministry's attempts to classify operations on a financial basis, and wondering why an operation for thyrotoxicosis should be paid for at a higher scale than one for an adenoma of the thyroid irrespective of the severity of the latter from the operative point of view. The lay administrators of hospitals are just managing to keep their heads above the shoal of papers, forms and instructions with which they are being inundated, while the newspapers are full of advertisements of vacancies for finance and administrative officers of all descriptions to run the hospitals now that they are under the control of the State. Student nurses from six East London hospitals have refused to accept the proffered scale of salaries and have informed the Minister that if their request for a meeting to discuss the matter is refused they will hand in their resignations.

Out of this chaos will presumably come order, and when it does the credit will be due (though almost certainly not given) to the doctors of the country.

BRITISH MEDICAL ASSOCIATION CONFERENCE

For the first time since 1939 the British Medical Association has this year been able to hold its annual meeting on a full scale. During the war the annual meeting was merely a business session to discuss essential matters, but this year the business sessions, which lasted for several days, were followed by the traditional scientific meetings, consisting of 19 scientific sections. The meetings were held in Cambridge under the presidency of Sir Lionel Whitby, the Regius Professor of Physic in the University of Cambridge. In spite of the present day difficulties in the form of hotel shortage, food rationing and the like, the meetings were most successful, both scientifically and socially. The attendance was not as large as had been expected, but the standard of discussion at the scientific sessions was commendably high. Outstanding among these was the discussion on the rôle of sympathectomy in the treatment of hypertension, which was initiated by a brilliantly delivered paper by R. H. Smithwick of Boston, Mass.

STREPTOMYCIN

Streptomycin is still headline news so far as this country is concerned, and some recent unfortunate newspaper publicity has brought to the fore once again the problem of supplies in the United Kingdom. In reply to a short debate in the Parliament the Minister of Health has now provided some figures which should go far towards clearing up the mystery which for some

unknown reason has surrounded the subject for a considerable time. Between November, 1946, and the present time 309 kg. have been imported from the United States at a cost of \$777,000. Large-scale production is at last beginning in this country, and it is estimated that from home sources 25 kg. will be available in July, 50 kg. in August and 100 kg. per month by the autumn. As it is estimated that 40 kg. per month will be sufficient to treat all cases of miliary tuberculosis, tuberculous meningitis and tracheobronchial tuberculosis, the estimated figure of 100 kg. to be obtained before the end of the year should allow of ample supplies for clinical trials in other conditions.

A point which is not generally appreciated, even by many doctors, is that shortage of supplies of streptomycin is not the only factor responsible for its restricted use. Equally important is the absence of adequate nursing staff. To treat the more acute forms of tuberculosis, such as tuberculous meningitis, imposes a strain upon the medical and nursing staff which can only be met when their numbers can be increased. The indiscriminate and uncontrolled use of streptomycin is not without its dangers, and whilst this is a point of view which patients and their relatives cannot be expected to understand, it is one which must be appreciated by the medical profession.

AN ORTHOPÆDIC PIONEER

The death, on July 24, at the age of 81, of Dame Agnes Hunt, D.B.E., R.R.C., has removed from our midst one of the greatest characters in the history of English orthopaedics. The daughter of a Shropshire squire, and herself a cripple, she founded in 1900, in an old house in her native village, an open-air hospital which is now known throughout the world as the Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry. The partnership between the then relatively unknown Liverpool orthopaedic surgeon and the irrepressible though crippled daughter of the country squire was irresistible, and there can be few orthopaedic surgeons of standing in any part of the world who have not made a point of visiting the great hospital which now proudly bears their great names. As has been aptly said of the days when they were both at the zenith of their power, "Robert Jones performed the operation while Miss Hunt performed the rest"! Rehabilitation was one of the many catchwords not yet invented in those days, but no one has appreciated its full potentialities and applied it more effectively than Dame Agnes Hunt did with her crippled children. *The Times* has well summed up her unique contribution to orthopaedics, and particularly the care of crippled children: "The will to have physically defective children cured, if surgery and care could do it, was incarnate in one woman on crutches, whose courage and determination have shown that this can be done without vast expenditure, if only the people who do it will but spend themselves, and inspire their staffs to do likewise". WILLIAM A. R. THOMSON

London, August, 1948.

The Australian Letter

(From our own correspondent)

Since the last letter there have been many conferences on the vexed matter of Free Medicine (meaning free drugs) between the B.M.A. and the Federal Government. Two things seem clear: (a) the demand by the public for free medicines has not been heavy since the scheme started on June 1; (b) the few physicians who have used it consistently claim that there are few if any drugs in common use which cannot be found in the official Formulary put out by the Government. Still the central question remains of the power of any government to limit a doctor's efforts to discharge his duty to his patients as he sees it. The Federal Government is gradually entering the field of medical practice in the latest developments whereby trained pathologists will be made available at strategic

places in rural areas to assist with diagnosis. All tuberculosis care is being taken over by Canberra, and mass radiological studies are being projected. The Commonwealth Government, by paying hospitals a per capita rate equal to what was once paid on the average by patients as ward fees, has made public ward care free everywhere. Some sectarian hospitals have not joined in this scheme.

Once again the mental hospitals are being given the most searching newspaper criticism, this time in New South Wales. The situation is not without interest to Canadians insofar as staff shortages are concerned. The state of New South Wales has approximately 12,000 mental beds, and a total medical staff of 34 doctors. At some of the state hospitals the number of nurses is half that required for the efficient functioning of the wards. Newspaper publicity has been largely directed to the actual day to day situation of the patients, in the matter of clothing, sanitation, and personal necessities. Little has so far been said about the medical problem presented by this staggering group of cases for whom care and maintenance only can be attempted with the present short staffing. Domestic staffs are being augmented where possible with immigrants from the Baltic countries. There has been considerable difficulty in the registration of nurses from England, with the result that the Minister for Immigration has refused to allot any further passages to nurses unless they are first guaranteed registration before leaving England. Immigrant doctors from Europe are required to take a minimum of three years in the undergraduate medical schools here before practicing.

A National University at Canberra, the Federal capital, has been approved in principle for some years, and an institute of anatomy has existed at Canberra. Recently it was decided to greatly expand the early beginnings and to this end invitations were sent to several well-known Australians in England to return to head up the work. Among these were Sir Howard Florey, to direct medical research, and Professor Oliphant in atomic physics. It is expected that no building will be possible for five years due to the critical shortage of materials in Australia.

The new buildings of the Medical Faculty at Adelaide in South Australia are nearing completion. Similarly, the medical school of the University of New Zealand, at Dunedin has a new building.

Dr. Robert Morrison of the Rockefeller Foundation has just completed an intensive survey of medical education in Australia and New Zealand and has returned to New York.

Invalids, sick persons and children under the age of four have been exempted under the stringent rules governing the use of electric heaters or gas fires imposed last month in view of the critical coal shortage affecting the major centres in Australia. A fine of £500 has been set for infractions of the rules, with the result that the almost total lack of central heating in such states as New South Wales has combined with the present severe influenza epidemic to further curtail industrial output.

W. C. GIBSON

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Reform (in medical education) is a question not merely of adding to the curriculum here and subtracting from it there, nor is it to be solved by the provision of new buildings and by the subdivision of departments, nor again is it concerned exclusively with the furtherance of research. It is a search for unity and synthesis in a subject which has a natural tendency to disunity and dispersion, a search for the ideal combination of science and empiricism; above all, a search for a solution which needs no periodic stimulation, but which being based on fundamental principles, automatically keeps itself alive.—*Medical Education*: Ffrangon Roberts, M.D.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

Injection Therapy for Angiomas. Crawford, G. M.: *J. Am. M. Ass.*, 137: 519, 1948.

While not claiming that this method of treatment is best for all cases the author considers that in view of its simplicity, efficiency and freedom from hazard it deserves more emphasis than it has in the past received. Although there is a pronounced tendency to spontaneous regression in the early years of life certain types of lesion present reasons other than purely cosmetic for intervention. Lesions interfering with vision, in or about the mouth, in the anogenital region or on pressure areas demand treatment. Large lesions of the more superficial type are prone to ulceration exposing the patient to infection, and scars may be disfiguring. Excision in selected lesions is a quick and satisfactory method of treatment but is open to a number of objections. Radiation therapy is the method most widely employed, but hazards and limitations exist. It should not be employed after 2 years of age, and in the senile type of cavernous angiomas which appear after middle life, usually on the head, radioresistance is notable. The author is opposed to the use of radiotherapy on the scalp, around the eyes, lips, genitalia or breasts and over bony prominences. He considers that possible radiation sequelæ on deeper structures should be kept in mind. Solid carbon dioxide, a popular and efficient method in the superficial angiomas, is not a satisfactory modality for use on cavernous lesions.

In a series of 190 patients treated with sclerosing injections all but 12 were treated with 30% sodium citrate, 5% monoethanolamine in 2% benzyl alcohol, or 30% invert sugar with the addition of 10% sodium chloride and 1% phenylethyl alcohol. The sodium citrate was replaced early in the series by the two latter agents, and half of the cases were treated with the monoethanolamine, but this was not shown to be appreciably more efficient than the invert sugar. A 24 or 26 gauge needle of sufficient length in proportion to the size of the lesion to require a minimum number of punctures was used. The injection was made either directly into the lesion or through the skin at its periphery. Haemorrhage was always readily controlled by firm pressure for 2 or 3 minutes. The quantity of solution instilled at the first treatment varied from 0.05 to 0.5 c.c. The amount was governed somewhat by the size of the lesion, but also by the pressure or absence of an allergic family history. The increase in quality was rapid with additional treatments if the lesion was large, and the operator was guided in determining the frequency of treatments by the relative activity of the tumour and its response to treatment. They varied accordingly from weekly to intervals of 1 to 3 months. Too superficial deposition of the fluid will nearly always result in sloughing. Blanching indicates that the needle must be moved to another portion of the tumour. Local reaction from a preceding treatment or absence of residual reaction but firmness throughout the tumour is an indication for postponement of a treatment. Ilaaste is not necessary once growth has been arrested. When the lesion is accessible from either a cutaneous or a mucous membrane surface the injection through the latter produces less discomfort.

D. E. H. CLEVELAND

Sarcoidosis. A Review and an Appraisal. Nicholson, H. E.: *J. Am. M. Ass.*, 136: 1034, 1948.

The author prefers the term sarcoidosis to sarcoid and other proposed names as it implies a wider distribution than sarcoid and emphasizes systemic involvement. It has the characteristics of a chronic, systemic, benign infection. While clinical diagnosis is unreliable, and the positive diagnosis rests ultimately on the histo-

logic findings, and while Michelson is emphatic in insisting that it is more than a cutaneous disease, no examination in suspected sarcoidosis is complete without searching for cutaneous and mucosal lesions. Since internal lesions usually are asymptomatic the first evidences are found in the skin. Every type of cutaneous change from erythema to tumour formation is found, hence polymorphy in this organ must be stressed. On account of its frequent close resemblance to other skin diseases microscopic examination is essential. Superficial and internal glands and lymph nodes are affected, and when ductless glands are invaded interference with their function may produce symptoms. The contents of the thoracic cavity and the liver may indicate their involvement by the evidence furnished by x-ray or liver puncture, but extensive involvement of lungs, pleura and hilar nodes may be asymptomatic. Classic sarcoidosis structure is readily identified by the pathologist, but even this may appear as a response to various infections such as tuberculosis, leprosy and brucellosis and foreign body reaction, so a complete clinical review must be taken into consideration in making the diagnosis. Tuberculosis is more selective in organ involvement than sarcoidosis; involvement of an organ system is the exception in tuberculosis. Untreated tuberculosis progresses if ignored, but sarcoidosis ignored does as well or better than with medical intervention. The etiology of sarcoidosis is as yet unknown. The theory of tuberculous causation is a popular one but bacteriologists have failed to present sufficient convincing evidence to support it. The alternate theory is that the disease has its own separate etiology.

D. E. H. CLEVELAND

Ineffectiveness of Aluminum Subacetate in Rheumatoid Arthritis. Blazer, A., Friedman, H. H. and Steinbrocker, O.: *New England J. Med.*, 238: 507, 1948.

Helfet reported favourable results in treatment of rheumatoid arthritis through the employment of aluminum salts by mouth. He considered the disease to be analogous to hyperparathyroidism, the major fault being an over-production of parathormone with resultant bone decalcification. The aluminum salt was used to combine with the phosphate of the diet to form insoluble compounds in the bowel and so prevent a rise in blood phosphate. The authors repeated this treatment in twelve cases carefully followed over periods of from one to two years. Only two patients improved and evidence of bone recalcification was demonstrated in only one case. Blood calcium and phosphorus levels were unaffected by the treatment. It is concluded that aluminum salts have no value in the treatment of rheumatoid arthritis.

NORMAN S. SKINNER

The Diagnosis of Mitral Insufficiency in Rheumatic Children. Kuttner, A. G. and Markowitz, M.: *Am. Heart J.*, 35: 718, 1948.

The authors are concerned with the criteria for a diagnosis of mitral insufficiency in children. They note that in the criteria published by the New York Heart Association, it is stated that without cardiac enlargement, deformity of the mitral valve should not be diagnosed. In children with a fairly loud blowing apical systolic murmur, even in the absence of detectable cardiac enlargement, a diagnosis of mitral insufficiency is frequently made. To test the justifiability of such a diagnosis, they approached the matter from a viewpoint of prognosis. Their study comprised 315 rheumatic fever patients between the ages of 6 and 15 years. Group 1 consisted of 171 patients who showed a soft, poorly transmitted apical systolic murmur. These cases were classified as being potential and possible rheumatic heart disease. Group 2 consisted of 144 patients, diagnosed as having mitral insufficiency because of the presence of a loud, blowing systolic murmur, maximal at the apex and well transmitted to the axilla. In neither group of patients was

there cardiac enlargement. The study was based on an average follow-up period of eight years.

Of the 171 patients in group 1 the diagnosis in 87% remained unchanged at the end of the follow-up period. Thirteen per cent developed definite cardiae lesions. However, in group 2, 69 or 48% of those diagnosed as mitral insufficieuey have developed further evidence of rheumatic heart disease. Twenty of these children have died—13 due to rheumatic infection and 7 due to bacterial endocarditis. Between group 1 and 2 there was no difference as to the type of initial infection, but in group 2, twice as many children gave a history of repeated rheumatic occurrences. The authors feel that the evidence presented indicates that the intensity of the apical systolic murmur is a valuable prognostic sign, and despite the absence of demonstrable cardiae enlargement, indicates organic damage.

ARNOLD L. JOHNSON

Problem of Sulfonamide-Resistant Haemolytic Streptococci. Hartman, T. L. and Weinstein, L.: *New England J. Med.*, 238: 560, 1948.

The authors found only one sulfonamide-resistant organism among 167 strains of haemolytic streptococci isolated at the Evans Memorial and Haynes Memorial Hospitals, Boston, during the fall and winter of 1946-47. The literature on the subject is reviewed and it is concluded that a sulfonamide-resistant streptococcus is only likely to arise as a mutation during sulfonamide therapy, and would constitute a medical problem only where a large proportion of the potential hosts were under treatment with the drug in question. Because of this possibility large-scale mass prophylactic programs should be used only as an emergency measure.

NORMAN S. SKINNER

Repair of Hiatus Hernia of the Diaphragm by the Supradiaphragmatic Approach. Sweet, R. H.: *New England J. Med.*, 238: 649, 1948.

In the majority of cases it is technically much easier to repair a hiatus hernia from above the diaphragm. Handling of the abdominal viscera is largely avoided and recurrence is much less frequent than when operation is done through the abdominal cavity. No deaths occurred in 51 patients operated upon transthoracically. Five developed postoperative complications (thrombo-phlebitis of leg veins in three, localized empyema requiring drainage in one, and one case of minor, superficial wound infection). X-ray study demonstrated one possible slight recurrence of herniation which was asymptomatic. Postoperative chest pain was not significant.

NORMAN S. SKINNER

Roentgenographic Studies of the Gastro-intestinal Tract Following Section of the Vagus Nerves for Peptic Ulcer. Ritvo, M. and Shaffer, I. A.: *New England J. Med.*, 238: 496, 1948.

Roentgenographic studies were made in 33 peptic ulcer patients who had been treated by section of the vagus nerves. During the early postoperative stage most cases showed gastric dilatation and atony, associated with very poor peristalsis and marked delay in gastric emptying. These changes were less evident in three patients with gastroenterostomies and in five with partial gastrectomies, these operations having been unsuccessfully employed as measures of treatment well before the period when vagotomy was considered. The degree of gastric dilatation following section of the vagi was so extreme in two cases as to necessitate subsequent gastroenterostomy.

Gastric motor function improved as the months passed after vagus section but no case showed a complete return to normal, the longest period of follow-up being fourteen months. Ulcers healed promptly, however, especially the stomal and jejunal ulcers in the patients with previous partial gastrectomies. No small

bowel abnormality was noted apart from slow motility which was considered the direct result of delayed gastric emptying.

NORMAN S SKINNER

Treatment of Arterial Embolism. Warren, R and Linton, R R: *New England J Med.*, 238: 421, 1948

Arterial emboli usually occur in middle aged cardiac patients and most commonly lodge at the bifurcation of a major artery, particularly at the femoral bifurcation. Possible sources of arterial emboli are the pulmonary veins; mural thrombi in the heart; mitral valve vegetations; atheromatous plaques in the aorta and, very rarely, the systemic veins or the right side of the heart via a septal defect. A closing ductus arteriosus may be the originating point of an arterial embolus in childhood. In the present series of 98 patients who suffered 172 arterial emboli at the Massachusetts General Hospital during the period 1937 to 1946 the site of lodgement was in the limbs in 63.9%. The source was considered to be from within the heart in 88.7%. Atrial fibrillation with presumed atrial thrombus was the major cause. Surgical embolectomy is the treatment of choice and should be carried out within ten hours of onset. The principal conservative methods of treatment are paravertebral novocaine block; intermittent venous occlusion; the oscillating bed; heparin and papaverine.

The authors stress the fact that whether surgical or conservative methods are employed treatment should be instituted promptly and carried out energetically.

NORMAN S SKINNER

Obstetrics and Gynaecology

Aberrant Endometrial Tissue and Instussusception. Southern, E. M.: *Brit. M. J.*, 1: 1178, 1948

A case of intussusception, with tissue showing all the appearances of endometrium situated at the apex of the entering ileum is presented. The microscopic appearances are suggestive of a metaplastic origin of the endometrial tissue and may be held to support the observations of Meyer and Kitai (1924), Novak (1926, 1947), Moench (1929) and others.

ROSS MITCHELL

Neonatal *E. coli* Meningitis After Prolonged Labour. Duval, H. R and Burrowes, J. T.: *Brit. M. J.*, 1: 1180, 1948

A short review of the literature is made with particular reference to the portals of entry of *E. coli* infection which leads to *E. coli* meningitis in the newborn. The history of a fatal case of *E. coli* meningitis in an infant of 3 days is given. The mother had intra partum eclampsia and prolonged labour, and on the third day of the puerperium developed *E. coli* pyelitis and endometritis. The dangers of prolonged labour, from the point of view of the child, are stressed.

ROSS MITCHELL

Phenolphthalein as a Test for the Determination of Alkalinity. Speck, G. Am J Obst & Gyn, 55: 1048, 1948

Phenolphthalein is instilled into the uterine cavity and, at the end of thirty minutes, the bladder is catheterized. If the uterine turns red or pink when alkalinized, the tubes are considered patent, if there is no discoloration the tubes are considered closed. This test is neither costly nor dangerous and can be easily performed by all.

ROSS MITCHELL

Treatment of Pelvic Endometriosis. Schmitz, H. E. and Towne, J. E.: Am J Obst. & Gyn., 55: 57, 1948

Pelvic endometriosis occurs most frequently in the childbearing period and is a major cause of sterility. Conservative treatment which will increase the possibility of conception is therefore, the most desirable form of therapy. A review of 130 cases treated with

this intent shows that 57 or 43.9% were treated by surgical procedure, 10 or 17.6% required radical surgery (removal of both ovaries with or without the uterus), 47 or 82.4% had one or both ovaries preserved, and 11 later conceived, giving birth to 13 infants, an incidence of 23.6% or a corrected incidence of 27.5%.

X-ray therapy was employed in 29 cases, of which 17 were given sufficient dosage to cause a permanent menopause. Twelve were treated with smaller dosage causing a menopause of from three to eight months. In this group two conceived and delivered three infants, an incidence of conception of 16.6%. X-ray therapy in this group proved satisfactory for secondary therapy when conservative surgery had failed. X-ray therapy of sufficient intensity to destroy ovarian function is indicated in cases where endometrial tissue has invaded the bowel or bladder. It obviates the necessity of surgical resection with its increased risk. Watchful expectancy or male hormone therapy is of value in cases with minimal disease and symptoms in young women. It enables one to postpone more radical procedures to the years when such therapy is less costly.

ROSS MITCHELL

Dermatology

Treatment of Eczema (Atopic Dermatitis) in Infancy. Glaser, J.: J. Am. M. Ass., 137: 527, 1948.

While not the most common, eczema or atopic dermatitis is the most important disease of infancy and childhood, and it is important that it should be distinguished from the more common seborrhoeic dermatitis and other forms of eczematous dermatitis due to varying causes for it indicates that one is dealing with constitutional allergy. It is a disease which is usually self limited and has a tendency to spontaneous remissions and eventual recovery. It is impossible to predict which cases will "outgrow" the disease, and which will persist throughout life with cutaneous or other systemic manifestations such as asthma. With every effort made to clear the child's skin and keep it clear psychic trauma in later years may be avoided. It is even possible that a tendency toward clinical mutation into other exhibitions of allergy may be checked by early establishment of a suitable general regimen. The observation that the incidence of eczema is lowest among breast fed infants, and is 7 times as great among those completely artificially fed indicates one prophylactic procedure which should be urged strongly in allergic families.

It was formerly believed that ingested allergens played the most important rôle in eczema but this is no longer regarded as a certainty, and trans-pulmonary penetration of allergens and inhalant allergens are of greater importance. Probable contact dermatitis has more in common with atopy than has been recognized in the past. Although positive evidence is lacking to support the common belief that house dust in a non-dermatitis, an environment as dust free as possible is an important therapeutic and prophylactic factor. Other commonly and probably justly popular agents are dusts and fibres of animal origin, dyes and latex. The author considers that soap should invariably be replaced with sulfonated oils, or the washing agent derived from burnt alcohol. For general bathing the familiar collodion bath or tar baths in 1/2 cupful of liquor carbonis detergens added to the tub in warm water. In the acute exudative stage 1/2% solution of glutamic acid in 1:10 dilution or potassium permanganate in 1:5000 to 1:10000 dilution are recommended. For the subacute and chronic stages tannic acid ointments are the most effective medication. For vesicular zinc paste, proportioned of 1 part each of zinc oxide and starch and 2 parts of soft paraffin is considered most satisfactory. The author favours the trial of a simple elimination diet, which is outlined, in most cases and considers that scratch testing is sometimes of value.

For systemic medication the so-called antihistamine drugs have been tried for their effect in controlling itching, but this is usually inconspicuous and variable.

As a deficiency of unsaturated fatty acids has been shown to exist often in atopic dermatitis, these are recommended in the form of soy bean oil or lard as a therapeutic adjunct.

Vaccination against smallpox should not be undertaken until the skin is perfectly clear but routine prophylactic treatment for diphtheria, pertussis and tetanus should not be avoided, reactions being no commoner in allergic than in non-allergic children. The courses may be started with but a fraction of the orthodox dose and continued until the required amount is given. Immunization and consequent avoidance of any later necessity for the antitoxins is important in diphtheria and tetanus. Hypoimmunization against pertussis is also important since respiratory allergies are more apt to follow pertussis in an allergic child.

D. E. H. CLEVELAND

Permanent Wave Process. Clinical Report with Special Reference to the Effect of Ammonium Thioglycolate on the Skin. Goldman, L., Mason L. and McDaniel, W.: *J. Am. M. Ass.*, 137: 354, 1948.

In view of the extensive use of cold waving solutions this report from the Kettering Laboratory of Applied Physiology of the College of Medicine of the University of Cincinnati is of considerable importance. Dermatitis of the scalp of patrons and of the hands of operators in beauty parlours is commonly met with and ascribed rightly or wrongly to the cold wave solution. The essential feature of the cold wave process is the dampening of the hair, which is wrapped around a rod of suitable diameter, with an alkaline reducing agent, usually thioglycolate. The wave is later fixed by the application of an oxidizing agent. No heat is used. Dermatitis has been observed on the scalp following this process and it is suggested from experiments that thioglycolate is a mild cutaneous irritant if applied undiluted over a prolonged period, acting as such more frequently than it acts as a sensitizer resulting in allergic dermatitis. The possibility of systemic toxicity resulting from cold waving has been considered and it is concluded that this does not result if the usual directions for its use are carefully followed. The cold wave process involves however the application of many things beside the ammonium thioglycolate solution which must be considered in investigating dermatitis following a cold wave. These are the materials used in the preliminary shampoo, the preliminary cleansing lotion, the oxidizing agent, the post-treatment shampoo material, the wave-setting material, perfumes, etc. Some of these are apparently more apt to produce allergic dermatitis. Dermatitis from ammonium thioglycolate inflicts cutaneous damage on the hands of operators much more frequently than on the scalps of patrons. It is not possible to protect their hands, since the hands, especially the left, are continuously dampened by the solution, and operators refuse to wear rubber gloves, and instead of exercising every precaution possible, as recommended by the authors, place undue dependence on so-called protective cream. Since an essential feature in the production of dermatitis by direct irritation from ammonium thioglycolate is prolonged exposure to a low dilution or undiluted material patch and similar contact tests are seldom of practical use. A detailed set of prophylactic instructions in the use of ammonium thioglycolate for patrons and operators is given.

D. E. H. CLEVELAND

Industrial Medicine

Pest Control with Sound Waves. Frings, H.: *Pests.* 16: 9, 1948.

That the Pied Piper of Hamlin with his ultrasonic flute may have been "on the beam" is suggested by the author of this article in which he discusses ultrasonic waves as a possibility in the future of rodent and insect control. That many animals can actually hear ultrasound, and that certain animals can use

them, is known. Bats can utilize them as a form of radar to guide their nocturnal flight. In view of possible uses in pest control it is important to determine their effects on animals which do not directly use them.

Newspaper reports that ultrasonic frequencies can be repellent to various insects and to birds have been unfounded. Experiments however have demonstrated the lethal effects of ultrasonic waves of great intensity in water, on living things and on micro-organisms, and, more recently, the effect of ultrasonic waves in air acting directly on air-inhabiting animals. The latter experiments have shown that high intensity air-borne ultrasonic waves, because of their great energy content, can produce great mechanical injury to small animals or thin structures, such as wings and external ears of mice, and can be absorbed by living animals or by their external coverings with the production of heat of destructive intensity. These facts give reason to believe that ultrasonic waves may have value in pest control, either as repellents which are unnoticeable by man or as killing agents. It has been reported that wild rats will attack the sound sources, so apparently the sounds have some effect on them. Reference is made also to the fact that ultrasonic waves can travel as well or in some cases, even better through solids and liquids than through air. This opens interesting prospects for their use in termite and powder post beetle control.

Before ultrasonic waves can be put to practical use, certain problems must be solved. It will be necessary to determine the ultrasonic frequency or combination of frequencies which are effective and the possible effects of fatigue or adaptation to these. The problem of attenuation is also important although there is no indication that great intensities are needed for repellency. Another difficulty is the production of sound shadows at high frequencies. For this reason it would be useless to train a siren sound-beam down a rat hole to cook a rat because the waves would not go around the turns. There is also the question of heating. Not only does heating of the animals occur in a high intensity ultrasonic beam, but heating of other objects occurs also. The author is of the opinion that research by physicist and engineer can and will aid in solving these present problems.

MARGARET H. WILTON

OBITUARIES

Dr. James Bryce Brown died at his home in Toronto on June 16, in his 65th year. He attended Paisley high school, Royal Military College and University of Toronto, where he graduated in medicine in 1908. He practised in Elmwood, Ont., for five years, going to England in 1913 for a postgraduate course. During the first great war he served in the Mesopotamia campaign, returning to Toronto after the war to be a general practitioner until he retired. Surviving are a brother and four sisters.

Dr. George Harold Carlisle of Winnipeg died on July 4, aged 66. Born at Peterborough, Ont., he graduated in medicine from Trinity University, Toronto in 1905 and after postgraduate work practised first at Brandon and later for 36 years at Winnipeg as a specialist in eye, ear, nose and throat disorders. During the first world war he enlisted with the 79th Battalion. Glen Campbell's Scouts, holding the rank of major, and later transferred to the 107th Battalion. To obtain service in France, he reverted to the rank of captain. He is survived by his widow, one son and one daughter and four grandchildren. Dr. Murray Carlisle of Grand Prairie, Alberta, is a brother.

Dr. William J. Cook, a graduate of McGill University, class of 1904, died July 19, at his summer home at Lake Penage, M.O.H. for Sudbury for 33 years, he was succeeded in 1940 by his son, Dr. J. Bernard Cook.

A native of Marmora, Dr. Cook came to Sudbury upon receiving his degree. After postgraduate work in England, he obtained his L.R.C.P. and M.R.C.S. Surviving are his widow, Dr. Faustina Kelly-Cook; two daughters, one son, four sisters and one brother.

Dr. Mervyn Homer W. Fizzell, aged 61, of Calgary, passed away on July 25 at his home. Dr. Fizzell was born in Bradford, Ont. He was a graduate in medicine of Queen's University. Following his graduation Dr. Fizzell practised at Loverna, Sask., Sylvan Lake, Alta. and Edson in 1936. In 1942 he joined the staff of the Colonel Belcher Hospital in Calgary and held that position until recently. Many reports of his many kindnesses and valuable work done are frequently heard since he has passed from the profession.

Dr. Alvan Foote Foss died at his home in Westmount July 4, after a long illness. He was 78. A graduate of McGill University in 1897, Dr. Foss specialized in anaesthesia and was for many years Chief anaesthetist at the Montreal Children's Hospital. Dr. Foss was born in Sherbrooke and practised in Lennoxville, Black Lake, Thetford Mines and St. Lambert. At the outbreak of the First Great War he enlisted in the medical corps and served overseas as medical officer with the First Division, 24th Battalion, Royal Montreal Regiment. On his return to Canada he opened a practice in Montreal. Survivors include his widow, a son and a brother.

Dr. A. Galloway died at the home of his son in Cannington, Ont., on June 24, at the age of 86. He retired 10 years ago and has lived at Cannington since. Born near Beaverton, Dr. Galloway graduated from the University of Toronto and started practising at Glenarm. Seven years later he moved to Woodville. Surviving are his widow, two sons, a brother and a sister.

Dr. E. D. Gillies, aged 73, died in Vancouver on July 6. Dr. Gillies came to Vancouver in 1906 and for many years, until his retirement in 1945, was associated with the Vancouver General Hospital. He was a life governor of the hospital. He graduated from McGill University in 1898. Survivors include a son and a brother.

Dr. William John Moore McFetridge died in Winnipeg on July 29 at the age of 46. Born in Douglas, Man., he was educated in Minnedosa and graduated in medicine from the University of Manitoba in 1927. He practised in Winnipeg from that date till 1939 when he joined the R.C.A.M.C. During the battle of Britain he was attached as Medical Officer in the Royal Air Force. At the end of the war he returned to Canada and practised at Ocean Falls, B.C. A short time ago he came to Winnipeg. He is survived by his widow and a son.

Dr. Fraser MacGregor died suddenly at his home in New Glasgow on July 3. He was born at MacLellan's Brook, Pictou County, and after a period of two years' study in the Faculty of Arts and Science at Dalhousie University he proceeded to McGill University where he graduated in 1917. During World War I he held the rank of Captain in the R.C.A.M.C. Following the war he pursued postgraduate work in surgery in the Montreal General Hospital for a period of four years. At the end of that time he began practice as a surgeon in the town of New Glasgow. About seven years ago he was compelled by ill-health to limit his practice greatly and during the past three years he was unable to undertake any active work. During his years of practice he was a prominent member of the staff of Aberdeen Hospital, New Glasgow, which has benefited by his will.

Dr. Frederick William MacKinnon died at the Ottawa Civic Hospital on July 17. He was 74. Born at Vankleek Hill, he graduated from McGill University

in 1897. He had been on the staff of Ottawa Civic Hospital ever since the hospital opened in 1924. Before that he was a surgeon on the staff of old St. Luke's Hospital. He had interned at St. Luke's and following his internship was appointed physician for the old Canada Atlantic Railway. Later, he was physician for the Canadian National Railways and the Chateau Laurier. He is survived by his widow and a daughter.

Dr. Walter N. Miner of Calais died at his home on July 15. Dr. Miner was born in New Brunswick in 1872. His early education was obtained in New Brunswick. He graduated in Medicine from Baltimore Medical School and did postgraduate studies at Johns Hopkins, Guy's Hospital London, and at Edinburgh University. He practised in Calais from 1899 till 1946, operating his own hospital, which he presented to the town of Calais in 1946. He was a charter member of the American College of Surgeons and a member of the Maine Medical, N.B. Medical Society and the C.M.A. Dr. John Miner of Calais is a son.

Dr. F. G. E. Pearson, aged 78, died suddenly on July 6 in Brantford, Ont. A native of Rockford, Norfolk County, where he was born in 1869, he came to Brantford from Weston in 1894. Surviving are three brothers and one sister. Dr. Pearson was a member of Brant Ave. United Church.

Le Dr Jérémie Poirier est décédé le 20 juin à Sainte-Adèle, Que. Âgé de 72 ans, il avait été maire de sa village laurentien, où il avait pratiqué la médecine pendant 40 ans. Il laisse quatre filles et une sœur.

Dr. Wilfred H. Robertson died at his home in Toronto on July 2, from a heart attack. He was in his 66th year. The son of the late Dr. Hugh R. Robertson, professor of anatomy at Trinity Medical College, Toronto, and its representative on the senate of the University of Toronto, he was born in Toronto and was educated at Jarvis Street Collegiate and University of Toronto where he graduated as a doctor in 1909. After serving as a captain in the Canadian Army Medical Corps at base hospitals in Toronto and Halifax during the First Great War, he returned to Toronto and resumed his practice. He was still practising at the time of his death and was an associate doctor at Toronto Western Hospital, where he took his internship. He had many hobbies, among them golf, stamp collecting and travel. Surviving are his widow, two sisters and a brother.

Dr. Ernest Rousseau of Three Rivers, Que., died on July 2 at his summer home in the Banlieue. He was 43 years of age and was laboratory chief of the St. Joseph Hospital. He had followed a special course earlier this summer at the Johns Hopkins Hospital, Baltimore and on returning to Three Rivers had failed to rally from an illness for which he had been under treatment. Dr. Rousseau was a vice-president of the Three Rivers Medical Society. During the war he directed the Red Cross Blood Clinic and was also President of the local Playgrounds Association.

He is survived by his widow, one son and one daughter as well as one brother.

Dr. Murray P. Smyth, aged 27, died in Sunnybrook Hospital, Toronto, on July 13. Graduating from the University of Toronto in 1944, he went overseas with the Royal Canadian Army Medical Corps. Born in Big Valley, Alberta, he received his early education there and attended Regiopolis College in Kingston upon graduation from Humberside Collegiate. He was a member of the Mississauga Golf Club. He is survived by his parents and a sister.

Dr. Andrew Park Stirrett, aged 53, head of the mission forces in Nigeria, Africa, died July 9 in the hospital he founded there. Born in Camlachie, Ontario,

Dr. Stirrett gave up a successful practice here about 50 years ago to dedicate his life to mission work in Africa. Except for world lecture tours he has remained at his post since 1900. He concentrated on finding a cure for native diseases and his successful work in treating sleeping sickness and other tropical diseases won him fame through the medical journals of the world. "His was a great personal sanctity," said a spokesman for the mission. "He was great enough to be called a saint." He is survived by a sister.

Dr. Victor Trottier died at his home in Windsor, Ontario, June 12, after a brief illness. Born at Laclede, Quebec, he graduated from the University of Western Ontario Medical School in 1907, and practised in Windsor for 30 years.

Dr. Albert Beverley Welford died in Alexandria, Virginia recently. He graduated in Medicine from the University of Toronto in 1880.

NEWS ITEMS

Alberta

The Parsons Clinic of Red Deer and the Smith Clinic of Camrose have been completed and are functioning very efficiently. These and other groups of medical men are doing fine work for the benefit of the surrounding areas.

Dr. R. R. McLean, formerly Superintendent of Ponoka Mental Hospital has been made Director of the Mental and Social Hygiene Department for the Province of Alberta. Dr. T. Michie was appointed to the position vacated by Dr. McLean. Dr. Michie is a graduate of the University of Alberta and following three years in medicine at the Mayo Clinic went on the staff of the Ponoka hospital.

The annual medical golf game was held in Edmonton in June and a fine time was had by all, even though the members did not always stay on the fairways.

Dr. C. B. Rich has returned by air from London, England where he has spent some time in special cardiac centres overseas.

Preparations are being made for the Annual Alberta Medical Association convention which is being held in Calgary this Fall.

Many of the profession in Alberta are on their holidays and are spending their time at Banff, Jasper or at one of the numerous and beautiful lakes of the Province.

W. C. WHITESIDE

British Columbia

The compulsory hospitalization plan of the British Columbia Government is gradually taking shape. The Government has issued its preliminary notices for registration which has to begin soon. Every British Columbia citizen must register—single men and householders, the latter registering for their dependents. The fee will be \$15.00 for single men or women, without dependents—\$24.00 for heads of families with one dependent, and \$30.00 for those with more than one dependent.

The next step will be the publication of methods and places of registration. The annual contribution may be made in one sum or by instalments, but the payment must be completed by next spring. The plan will go into operation at the beginning of the year.

One statement made by the authorities in connection with this hospitalization plan would seem to invite questions. This is to the effect that British Columbia has more hospital accommodation per capita than any other Province, namely 6 beds per 1,000 of population, as compared with 4.5 beds per 1,000 for the rest of Canada. Whether this is true or not, it is a fact that there is a woeful shortage of hospital beds in the Province, and we know of no centre of any size where there is an adequate supply. Under a compulsory hospitalization plan, the shortage, one would think, is bound to be rendered even more acute. Perhaps the grants made by the Federal Government, and present plans for increasing hospital accommodation, will solve the problem, but the solution cannot be reached for some years.

The Annual Meeting of the British Columbia Medical Association will be held in Vancouver on September 29 to October 1. Plans are now being made for it, and a very strong slate of speakers has been prepared. The speakers are as follows: Dr. Louis Berger, Quebec, Professor of Pathology, Laval University; Dr. E. F. Brooks, Toronto, Assistant Professor of Medicine, University of Toronto; Dr. A. D. McLachlin, London, Professor of Surgery, University of Western Ontario; Dr. William Magner, Toronto, Assistant Professor of Pathology, University of Toronto; Dr. J. D. Adamson, Winnipeg, Professor of Medicine, University of Manitoba.

The Vancouver Medical Association celebrates its fiftieth anniversary this year, and preparations are now in hand for marking this anniversary by a dinner and other functions, to be held in December. At the dinner to be held on December 2, the J. M. Pearson Memorial Lecture will be inaugurated. This is in honour of Dr. J. M. Pearson, who was one of the main founders of the Association and its library; following his death some years ago, a fund was established, and the Leadership inaugurated. This will be the first Pearson Lecture, and Vancouver has been fortunate in securing as the Lecturer, Dr. J. S. L. Browne of the Medical Department of McGill.

The medical profession of Vancouver, and indeed of British Columbia, sustained a severe loss in the death of Dr. B. D. Gillies recently. Dr. Gillies had been in practice in Vancouver since 1906 and was one of the leading internists of that city. He was formerly resident pathologist at the Montreal General Hospital, and had a distinguished career in British Columbia as consultant and internist.

J. H. MACDERMOT

New Brunswick

Dr. G. W. A. Keddy is doing a short course of post-graduate study in Surgery in Montreal.

Sir Wm. Fletcher Shaw of Manchester, England, while a guest of Dr. Geo. White in Saint John, appeared as guest speaker at a special summer meeting of the Saint John Medical Society. He spoke on "Medical affairs in England at the present time", and his personal opinions showed another aspect of the medical picture in England somewhat in contrast to the reports expressed by proponents of the present scheme.

The number of Maritime members of the C.M.A. attending the annual meeting in Toronto was large, and this scribe considered himself lucky to be of this number this year after several years' absence. All things change, so it was amusing to pass unknown to classmates and other friends due apparently to continued loss of cranial hairy covering.

The chairman in charge of the Cancer diagnostic centres throughout the province met in Saint John in July for a two day session to review the work of their clinics and to study administrative and clinical problems

Dr. T. J. Pasby of Toronto has announced the opening of his office with practice limited to ophthalmology. He was with the R.C.A.F. for five years and later did postgraduate work in Toronto. Last January he presented at the Toronto Academy of Medicine the results of some studies he had made on the eyes of diabetic patients.

Dr. R. T. Noble and Mrs. Noble recently celebrated their fiftieth wedding anniversary.

Dr. S. A. S. Murkin, Nottingham, England, and twenty-seven other orthopedic surgeons from United Kingdom spent forty-eight hours in Toronto as part of their continental tour following the convention of orthopedic surgeons in Quebec. Thirteen of the younger surgeons were sponsored by the Nuffield Trust.

The Medical Alumni Association of Toronto elected the following officers at the annual meeting: honorary president, Dr. Marion Kerr; president, Dr. Dorothy Daley; first vice president, Dr. G. C. Maloney; second vice president, Dr. Helen Muir Wilson; third vice-president, Dr. Helen McKinley; fourth vice president, Dr. Marion Ross; out of town vice-president, Dr. Elizabeth Stockdale Martin of Guelph; secretary, Dr. Alice Whiteside Gray; treasurer, Dr. Doris Prowse Denne.

LILLIAN A. CHASE

Saskatchewan

Very recent information that Dr. R. G. Ferguson is retiring as General Medical Superintendent of the Saskatchewan Anti Tuberculosis League, has been received by the Saskatchewan Division. Dr. Ferguson has built up one of the most successful anti tuberculosis programs, not only in Canada, but in the world. Although Saskatchewan claims him as their own, the whole profession of Canada will say, "thank you", for a job well done. We wish Dr. Ferguson every enjoyment of his newly found leisure time.

Dr. C. H. Stapleford is retiring from the staff of the Saskatchewan Hospital at Weyburn, and will reside at Westboro, near Ottawa.

At the annual Convocation of McGill University, held in Montreal on May 26, Dr. George F. Kipkie of Regina received the degree of Master of Science, and Dr. W. E. Upthegrove of Saskatoon, Diploma in Anaesthesia.

Dr. M. Dantow has taken over the duties of Saskatoon City Health Officer. Dr. Dantow was formerly with the Department of Public Health as Medical Health Officer of Health Region No. 13 at North Battleford.

Dr. L. M. Davey, who was Medical Health Officer for Health Region No. 1 at Swift Current has resigned his position and entered private practice in Alberta.

Dr. B. Bueove has resigned as Medical Health Officer for Health Region No. 3 at Weyburn and joined Dr. M. Rubin in practice at Foam Lake.

Dr. A. Wilson who retired several months ago from his position of Health Officer for the City of Saskatoon, has left with Mrs. Wilson to reside in Vancouver.

Dr. G. H. Haines was entertained recently at dinner by the Saskatoon and District Medical Society. Dr. Haines was for 18 years with the Tuberculosis League, and on the staff of the Saskatoon Sanatorium. He has accepted a position on the staff of Firland Sanatorium in Seattle, Wash. This is a new institution associated with the University.

Building of the medical college at the University of Saskatchewan is progressing nicely. The Caduceus has been placed above the main entrance. It is expected that sufficient progress will be made this summer to allow workmen to complete the interior of the lower floors this winter. The foundations for the University Hospital, immediately adjacent to the medical school are now being panned. G. G. FERGUSON

General

Montreal Medico-Chirurgical Society Annual Fall Clinical Convention October 18 to 23 inclusive. Advance notice of meetings will be mailed to members. For information apply to the Montreal Medico-Chirurgical Society, 718 Medical Arts Building, Montreal.

International Congress on Rheumatic Disease. The first post war International Congress on Rheumatic Diseases is to be held at the Waldorf Astoria Hotel, New York City, from May 30 to June 3, 1949. This meeting is sponsored by the International League against Rheumatism and the American Rheumatism Association is acting as host. Funds have been obtained by subscription from members of this organization and others to enable prominent European rheumatologists and research workers to be present. The Canadian Rheumatism Association is an affiliate. It is expected that the meeting in New York will be outstanding. The three official languages will be English, French and Spanish. It is hoped to employ earphones, as presently used by the United Nations, which will permit of immediate translation into the two other official languages.

Reservations can be obtained in nearby hotels for a daily minimum of \$6.00. Obviously arrangements for such a meeting must be made well in advance. Enquiries are invited by the president and secretary-treasurer of the Canadian Rheumatism Association. President: H. P. Wright, 1414 Drummond St., Montreal, Que. Secretary-Treasurer: Dr. D. C. Graham, 3 Cran dall Rd., Toronto, Ont.

Britain's Charter of Social Security. Revised figures now available permit of the following estimates: The combined cost of National Insurance and National Assistance during the first year is estimated at £519 million, of this total £315 million will be met by insurance contribution, another £21 million by interest on the Reserve Fund and £183 million will fall on the Exchequer to be met from taxation. The Exchequer will contribute another £60 million to meet the cost of Family Allowances. It is estimated that the cost of the Industrial Injuries Scheme, when it reaches maturity, will rise to £29 million a year, of which £5 million will come from taxes and £24 million from employers and workers equally. No comprehensive estimate is yet available for the National Health Service but the probable cost in England and Wales alone for the first nine months is put at £180 million, of which about three quarters must be met from taxes and local taxes. The cost is expected to rise steeply as more people qualify.

In recognition of his studies on "Sludged Blood" the College of Physicians awarded on July 14, 1948, the Alvarenga Prize for this year to Melvin H. Knisely, M.D., of the University of Chicago. The Alvarenga Prize was established by the will of Pedro Francisco da Costa Alvarenga of Lisbon, Portugal, an Associate Fellow of the College of Physicians of Philadelphia, "to be awarded annually by the College of Physicians on each anniversary of the death of the testator, July 14, 1883. The College usually makes this award for outstanding work and invites the recipient to deliver an Alvarenga Lecture before the College."

We are informed that a new annual review of medical progress is to be issued, entitled *Medicine of the Year*. This is to be under the editorial management

FALL GRADUATE INSTRUCTIONAL COURSE IN ALLERGY
THE AMERICAN COLLEGE OF ALLERGISTS
University of Oregon Medical School, Portland, Oregon
November 8 - 12, 1948 inclusive
SCHEDULE OF SUBJECTS AND FACULTY

MONDAY, NOVEMBER 8

Fundamentals of Allergy and
Miscellaneous Manifestations

- A.M.
8:30-9:30—Registration
9:30-9:45—Address of Welcome: David Boyd, M.D., Dean, University of Oregon Medical School, Portland, Oregon
9:45-10:40—Bronchial Asthma: Diagnosis Harry I. Rogers, M.D., Jefferson Hospital Allergy Clinic, Jefferson Medical College, Philadelphia, Pennsylvania.
10:45-11:35—Bronchial Asthma—Treatment Harry I. Rogers, M.D., Jefferson Hospital Allergy Clinic, Jefferson Medical College, Philadelphia, Pennsylvania.
11:45-12:30—Immunological Aspects of Allergy Harry Sears, Ph.D., Professor of Bacteriology, University of Oregon Medical School, Portland, Oregon.

P.M.

- 2:00-2:35—The Physiology of Allergy: William Youmans, M.D., Professor of Physiology, University of Oregon Medical School, Portland, Oregon.
3:00-3:35—Pharmacology of Drugs Used in Allergy: Norman A. Davis, M.D., Professor of Pharmacology, University of Oregon Medical School, Portland, Oregon.
4:00-4:25—Cardiac Asthma: Howard Lewis, M.D., Professor of Medicine, University of Oregon Medical School, Portland, Oregon.
4:30-5:00—Ulcerative Colitis: Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, Berkeley, California.
7:00—Informal Dinner—Speaker: George E. Rockwell, M.D., President, The American College of Allergists.

TUESDAY, NOVEMBER 9

Gastro-Intestinal and Food Allergy

- A.M.
9:00-9:40—Food Allergy: Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, Berkeley, California.
9:45-10:25—Migraine: J. Warrick Thomas, M.D., Thomas Clinic, Richmond, Virginia.
10:30-11:10—Elimination Diet for the Diagnosis and Control of Food Allergy: Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, Berkeley, California.
11:15-11:55—Dietary Management of Food Sensitive Patients: Albert H. Rowe, M.D., Lecturer in Medicine, University of California Medical School, Berkeley, California.
12:00-12:30—Bacterial Allergy: Robert Louis Benson, M.D., Clinical Professor, University of Oregon Medical School, Portland, Oregon.

Clinical Allergy

- P.M.
2:00-2:30—Skin Test—Demonstration: Roy Matteri, M.D., Clinical Instructor, University of Oregon Medical School, Portland, Oregon.
2:30-3:00—Clinical Session (Skin Testing, Technic, and Interpretation and Demonstration of Preparation of Extracts): Merle W. Moore, M.D., Assistant Clinical Professor, University of Oregon Medical School, Portland, Oregon.

WEDNESDAY, NOVEMBER 10

Dermatologic Allergy

- A.M.
9:00-10:35—Allergic Dermatoses—Atopic and Contact Dermatitis: A. Rostenberg, Jr., M.D., Associate Professor of Dermatology, University of Illinois College of Medicine, Chicago, Illinois.
10:40-11:10—Urticaria and Angioneurotic Edema: Merle W. Moore, M.D., Assistant Clinical Professor, University of Oregon Medical School, Portland, Oregon.
11:15-11:45—Drug Allergy: George E. Rockwell, M.D., President, The American College of Allergists, Milford, Ohio.
11:50-12:30—General Principles of Cutaneous Allergy Therapy, Including Emergency Skin Testing: A. Rostenberg, Jr., M.D., Associate Professor of Dermatology, University of Illinois College of Medicine, Chicago, Illinois.

Pediatric Allergy

- P.M.
2:00-2:40—Infantile Eczema: M. Murray Peshkin, M.D., Instructor, College of Physicians and Surgeons, Postgraduate Medical Extension, Columbia University, New York, New York.
2:45-3:25—Management of the Pre-Allergic Child: M. Murray Peshkin, M.D., Instructor, College of Physicians and Surgeons, Postgraduate Medical Extension, Columbia University, New York, New York.
3:30-4:10—Characteristics of the Allergic Child: Norman W. Clein, M.D., Director of Children's Clinic, Chief of Pediatric Services, Kings County Hospital, Brooklyn, New York.
4:15-5:00—Special Problems in Treatment and Management of Asthma in Children: M. Murray Peshkin, M.D., Instructor, College of Physicians and Surgeons, Postgraduate Medical Extension, Columbia University, New York, New York.
5:00-10:00—Evening Informal Discussion Groups: Albert H. Rowe, M.D., General Chairman.

THURSDAY, NOVEMBER 11

Miscellaneous Manifestations of Allergy

- A.M.
9:00-9:40—Unusual and Obscure Conditions of Allergy: Orval R. Withers, M.D., Associate Professor of Medicine, School of Medicine, University of Kansas, Kansas City, Kansas.
9:45-10:25—Ocular Allergy: J. Warrick Thomas, M.D., Thomas Clinic, Richmond, Virginia.
10:30-11:10—Physical Allergy: Frank Perlman, M.D., Assistant Clinical Professor, University of Oregon Medical School, Portland, Oregon.
11:15-12:00—Cerebral Manifestations of Allergy Including Aural Allergy Harry I. Rogers, M.D., Jefferson Hospital Allergy Clinic, Jefferson Medical College, Philadelphia, Pennsylvania.

P.M.

- 2:00-2:30—Present Status of Antihistaminic Drugs: George E. Rockwell, M.D., Millord, Ohio.
2:35-3:25—Allergic Bronchitis, Bronchiectasis and Loeffler's Syndrome: Harry L. Rogers, M.D., Jefferson Hospital Allergy Clinic, Jefferson Medical College, Philadelphia, Pennsylvania.
3:30-4:25—Vascular Allergy: Hyman Miller, M.D., Assistant Clinical Professor of Medicine in Allergy, University of Southern California, Los Angeles, California.
4:30-5:00—Joint Allergy: Robert Louis Benson, M.D., Clinical Professor, University of Oregon Medical School, Portland, Oregon.
8:00-10:00—Evening Informal Discussion Groups: Albert H. Rowe, M.D., General Chairman.

FRIDAY, NOVEMBER 12

Respiratory and Miscellaneous Allergies

- A.M.
9:00-9:30—The Botany of Hay Fever Plants: James E. Stroh, M.D., Assistant Clinical Professor of Medicine, Head of the Department of Allergy, University of Washington School of Medicine, Seattle, Washington.
9:35-10:25—Hay Fever—Diagnosis, Treatment and Management: Merle W. Moore, M.D., Assistant Clinical Professor, University of Oregon Medical School, Portland, Oregon.
10:30-11:25—Mold Allergy: Symptoms, Diagnosis and Treatment: Fred W. Wittich, M.D., Secretary-Treasurer, The American College of Allergists, Minneapolis, Minnesota.
11:30-12:00—Perennial Allergic Rhinitis: Orval R. Withers, M.D., Associate Professor of Medicine, School of Medicine, University of Kansas, Kansas City, Kansas.
12:05-12:30—Pollen Counts and Demonstration (Photomicrograph Illustrations): Frank Perlman, M.D., Assistant Clinical Professor of Medicine, University of Washington School of Medicine, Seattle, Washington.
P.M.
2:00-2:35—Pathology of Asthma: Warren Hunter, M.D., Professor of Pathology, University of Oregon Medical School, Portland, Oregon.
3:00-3:50—Basic Principles of Allergy: Fred W. Wittich, M.D., Secretary-Treasurer, The American College of Allergists, Minneapolis, Minnesota.
3:55-4:25—Treatment of Status Asthmaticus: J. Warrick Thomas, M.D., Thomas Clinic, Richmond, Virginia.
4:30-5:30—X-ray Diagnosis and Therapy: Ivan Woolley, M.D., Clinical Associate, University of Oregon Medical School, Portland, Oregon.

The fee for the course is \$75.00 payable at the registration desk, University of Oregon Medical School, Portland, Oregon. Headquarters is at the Heathman Hotel. Applications for the course and a postcard giving hotel rates addressed to the Heathman Hotel will be sent to you by writing to the Secretary, Dr. Fred W. Wittich, The American College of Allergists, 423 LaSalle Medical Building, Minneapolis 2, Minnesota.

and direction of Dr. John B. Youmans, Dean and Professor of Medicine, University of Illinois. The contributors will include such well known writers as Dr. Hugh J. Morgan of Vanderbilt University; Dr. Frank Whittaker, Memphis, Tennessee; Dr. Henry G. Poncher, Chicago, Illinois; and Dr. Warren H. Cole, Chicago, Illinois. The review will cover the general progress in medicine during the preceding year, and will be about 100 to 120 pages. The subscription price is \$1.50 per annum. It is requested that those desiring to contribute send in their names to Dr. Youmans no later than January 1, 1949.

BOOK REVIEWS

Modern Trends in Ophthalmology. Edited by Arnold Sorsby. Vol. II. 600 pp., illust. \$18.50. Butterworth & Co. (Publishers) Ltd., Bell Yard, Temple Bar, London, 1948.

This volume follows much the same pattern as Vol. I, which appeared in 1940. In a series of chapters by noted authors the recent advances in ophthalmology and allied sciences are reviewed and consolidated. Such diversity of subjects are dealt with as the physics of light, the physiology of vision, therapeutics, surgery, and industrial ophthalmology. As should be the case, advances made owing to the opportunities and stimulation of the war have been generously included. The whole forms a most valuable addition to ophthalmic literature. It will be particularly valuable to those ophthalmologists who, owing to the pressure of duty during the past crowded years, have not been able to keep up with their reading in current journals. The material is well ordered and written. The illustrations are numerous and well chosen.

Modern Trends in Dermatology. Edited by R. M. B. MacKenna, Physician in charge, dermatological department, and lecturer in dermatology, St. Bartholomew's Hospital, London. 432 pp., illust. \$12.50. Butterworth & Co. (Publishers) Ltd., Bell Yard, Temple Bar, W.C.2, London, 1948.

Here is something new and different: a book which attempts to correlate the advances that have been and are being made in Dermatology and where they are leading us. The morphological era in Dermatology has been a full and successful one but has now given way to the functional one. The Editor of this volume has attempted to ascertain the principal modern trends in Dermatology. He has delegated the task to men, only a few of whom are dermatologists, the majority being experts in allied fields. The first chapter opens with a general review of the past and present basic investigative work in Dermatology with thoughts for the future. The next eight chapters are devoted to the anatomy, physiology and functional pathology, nutrition, biochemistry and bacteriology of the skin. Then comes a series of chapters on various clinical problems among which are those on the hormones, parasitology, mycology, the occupational dermatoses, the tropical diseases and finally atrophies and scleroses of the skin. The chapter on the modern trends in therapy is interesting, those on the prevention of cutaneous diseases show a real appreciation and a need for rehabilitation of the patients from both the psychological as well as the physical aspects. The chapter on statistics, somewhat technical, should be read by all who attempt to give statistical surveys of disease. A better realization of the inherent errors possible in such studies is obtained.

The rôle played by psychic disturbances in production of various dermatoses is, in the opinion of the reviewer, greatly overemphasized. Just as dermatologists tend to underemphasize personality changes, the psychiatrist has certainly gone to the opposite extreme. Much more and better controlled work in this field is badly needed. The reviewer was tremendously stimulated by this volume. He found a correlation of

studies nowhere else to be found. It should be of interest to all dermatologists and particularly those who are engaged in the field of investigative dermatology.

Gardiner's Handbook of Skin Diseases. Revised by J. Kinnear, Lecturer in Diseases of the Skin, St. Andrew's University. 265 pp., illust. \$3.75. E. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada, Toronto, 1948.

The latest edition of this popular handbook deserves more than passing notice. It is brief. It can be read through with attention in two hours. It is thoroughly up-to-date, such recent advances as the use of calciferol in *lupus vulgaris*, BAL in heavy metal poisoning, the dangers attending indiscriminate topical use of the sulfonamides, modern views on the question of allergy and sensitization, all receiving adequate consideration. Its practical, common-sense approach is indicated by such a remark as "The secret of successful local treatment of diseases of the skin lies in the recognition of the state of the skin as much as, if not more than, in the diagnosis of the actual disease". Criticism might be made of the recommendation that wet dressings used in acute inflammations should be covered with jaconet, and the failure in discussing the diagnosis of primary syphilis, to call attention to the sero-negative stage of the primary lesion in its incipiency, when reliance should be placed entirely upon the dark field examination and never solely on the reaction of the blood serum. The illustrations, both black and white and Dufaycolor photographs are numerous, excellently done and representative, but the few coloured illustrations from moulages might have been omitted. This is an excellent book for the student and the general practitioner and he can rarely go wrong in following its guidance.

Gynaecological and Obstetrical Urology. H. S. Everett, Associate Professor of Gynaecology, the Johns Hopkins University. 556 pp., illust. 2nd ed. \$6.00. The Williams & Wilkins Co., Baltimore, 1947.

This is a good book. It is well printed on good paper and is extensively illustrated with good cuts. There are a small number of typographic errors, including one on the second line of the first page, but no more than most books have. It deals with most of the surgical diseases of the urinary tract which occur in women, and thus includes discussion of certain conditions which are related to obstetrics and gynaecology only by coincidence. The sections on cystoscopy and on bladder tumours have been added to, or considerably revised from the first edition.

As might be expected in a book from this university, considerable attention is paid to the opinions of Guy Hunner; while these opinions are not entirely accepted by present-day urologists, they are well and fairly presented in the book. The section on Hunner ulcer does not appear to have been revised, as it does not discuss treatment by the presently accepted method, with silver nitrate solution and perciain. The author has chosen to discuss enuresis, but does not mention the use of amphetamines in its management. The book is recommended to practitioners in the fields concerned.

Heart—A Physiologic and Clinical Study of Cardio-Vascular Diseases. Aldo A. Luisada, Instructor in Physiology and Pharmacology, Tufts College Medical School, Lecturer in Medicine; Lecturer, Post-graduate Division, Tufts College Medical School, Ferrara, Italy. With a foreword by Herman L. Blumgart, Physician-in-Chief, Beth Israel Hospital. 653 pp., illust. \$10. The Williams & Wilkins Co., Baltimore; The University of Toronto Press, Toronto, 1948.

This book was written with the intention of making available to the general practitioner a broad base of information on the cardiovascular system. For this task Dr. Luisada is eminently suited, for he combines a detailed knowledge of cardiology with a background

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of laboratory investigation. In part, the aim of the author has been achieved in that the reader will undoubtedly learn much about the heart and heart disease which he did not know before, but it is doubtful whether this is the best possible book which could have been written on the subject. In many cases findings are not explained as clearly as they might be. In the description of various syndromes and diseases there is a tendency for signs and symptoms to be presented first, with a short explanation for their mechanism of production attempted later. This is particularly unsatisfactory in a subject such as this, where an understanding of the mechanism at once gives the clinician an appreciation of the signs and symptoms which are to be expected. Further, in the subject of cardiology, both physiology and pharmacology have contributed particularly heavily so that we have passed beyond the stage of cataloguing signs and empirically listing therapy. The book is, however, very thorough and there is sufficient merit in the presentation to repay careful reading.

Illustrative Electrocardiography. J. Burstein, Visiting Electrocardiographer and Chief of the Cardiac Clinic, Morrisania City Hospital, New York; and N. Bloom, Associate Professor of Medicine and Chief of the Department of Electrocardiography, Medical College of Virginia, Richmond, Virginia. 309 pp., illust. \$6.00. D. Appleton Century Co., New York, 1948.

This edition presents considerable revision, and practically all of the electrocardiographic plates are new. A chapter has been added dealing with Radiology of the Heart, by Dr. Philip Slater, which is of an elementary nature. There are a number of items of interest which are omitted in this third edition. For example, there is a chapter on the use of multiple precordial leads but with few exceptions the illustrative plates show only a single "lead iv". There is but a sentence referring to the possible use of the precordial lead pattern in the diagnosis of right and left ventricular hypertrophy, although there are short sections dealing with ventricular "strain". Little attention has been given to electrocardiography in congenital heart disease. It is felt that such omissions lessen the value of this book.

Man—Weather—Sun. W. F. Petersen. 493 pp., illust. \$12.50. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1947.

During the past fifteen years Dr. Petersen has published a series of volumes under the general title of "The Patient and the Weather". These books contain a large mass of statistical and clinical material that does not lend itself to any simple interpretation. With the announcement of this comparatively small volume, one might have hoped that some readily intelligible analysis or summary might be made. However, as the author states, the pathway to his various conclusions is still involved and it is difficult to find one's way through much of the argument presented. This book does not throw much light on the problems that are the special concern to the practising physician.

Neurology of the Ocular Muscles. D. G. Cogan, Associate Professor of Ophthalmology, Harvard Medical School. 225 pp., illust. \$7.50. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1948.

In recent years there has been a tremendous advance in our understanding of the oculorotary muscles, but with all this volume of new material, new ideas, and new methods, there was no new textbook in which it was properly sifted out and presented so that it could be intelligently grasped by the student of ophthalmology, until in 1947 Dr. Richard G. Scobee introduced his superb book, "The Oculorotary Muscles", which is destined to become a classic. Now

Dr. Cogan's book appears on the scene to bridge the remaining gap between ophthalmology and neurology. This is a book essentially for the neuro-ophthalmologist. It goes much further into the realm of neurology than does Scobee and is a valuable adjunct to the library of both ophthalmologist and neurologist. To quote the author, the book "attempts to correlate the clinical manifestations of disturbances of the ocular motor system with its neuroanatomic and neurophysiologic architecture" . . . it presents "the physiologic and anatomic bases for the ocular motor disturbances as indissociable from the clinical manifestations"; . . . "the data are arranged according to objective signs rather than disease entities". The book deals essentially with the localization of the site of a lesion and "only secondarily with the nature of the underlying disease process". As the neuro-ophthalmologist is rarely asked to do more than localize the site, "the text is so arranged as to emphasize analysis of localizing signs and symptoms and little or no space is given to treatment". The greater part of the book is taken up with the supranuclear connections of the ocular motor system. It concludes with an excellent chapter on Nystagmus and an imposing list of 825 references.

Organic Form and Related Biological Problems. Samuel J. Holmes. 169 pp. \$5.00. University of California Press, Berkeley and Los Angeles, 1948.

For all who are interested in fundamental problems of growth and development, and particularly for those who as students attempted to evaluate the arguments of Holmes, great satisfaction is to be found in this, his most recent book. It is noteworthy that a man towards the close of a long career should still be modifying his working hypotheses and fitting them in with the most recent findings of modern genetics. Holmes points out very clearly that any analysis of development and differentiation must rest ultimately on the nature of the hereditary materials, the genes. The discussion also carries on into the more recent field of autocatalytic enzymes and viruses.

Medico-Legal Problems. Edited by S. A. Levinson, University of Illinois College of Medicine for the Committees of the Institute of Medicine and the Chicago Bar Association. 255 pp. illust. \$6.00. J. B. Lippincott Co., Philadelphia, London and Montreal, 1948.

This is a record of prepared discussions and question and answer periods between a medical and a bar association with subjects of current interest which are puzzling both groups. The subjects are live, but the discussions can scarcely be considered so—for Canadians at least. "The Medical Witness in Court—Expert Testimony" is given over largely to the statement of abuses in Illinois Courts and suggestions for their remedy. "Artificial Insemination: Its Medico-Legal Implications" deals with reasons and indications for the procedure, methods and technique, and leaves the question of legal safeguards and safety exactly as it was before the discussion—there being no laws or precedents to use as guides. The whole question, medical, legal and moral is presented and many ramifications are noted. "The Practice of Pathology and Its Medico-Legal Aspects" demonstrates so many differences between various American laws and between American and Canadian laws that it might easily be misleading to a Canadian physician. The same is true of "Operations to Produce Sterility: Medico-Legal Implications." "Trauma and Tumours in Industrial Medicine"—in which is discussed the relation between any trauma and any subsequent tumours or metastases—deals with and demonstrates the wide differences between the legal and the scientific methods of trying to prove a truth, and fails to arrive at the truth. This may be a better book than the reviewer thinks it is, but its value to a Canadian physician without a legal background is slight—and if may actually be misleading.

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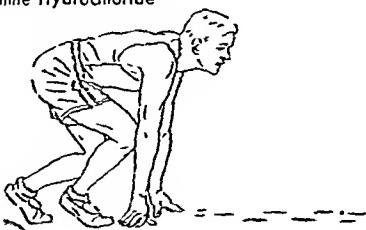
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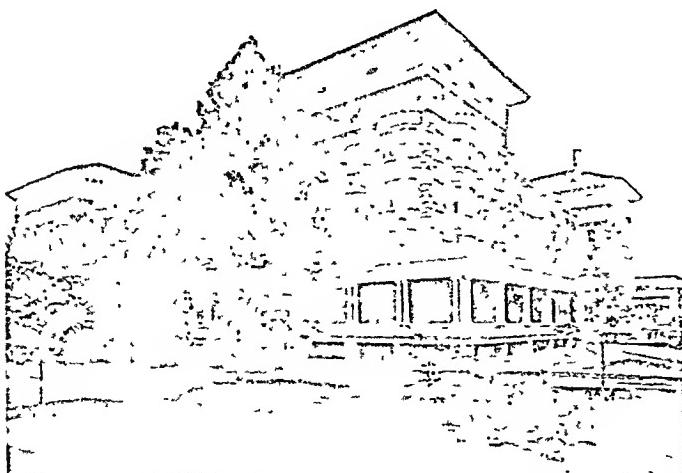
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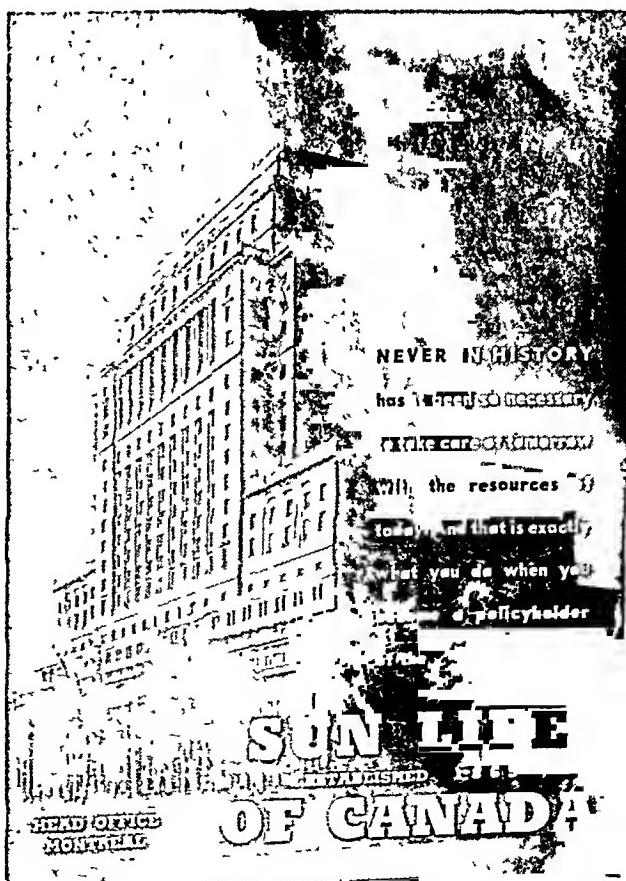
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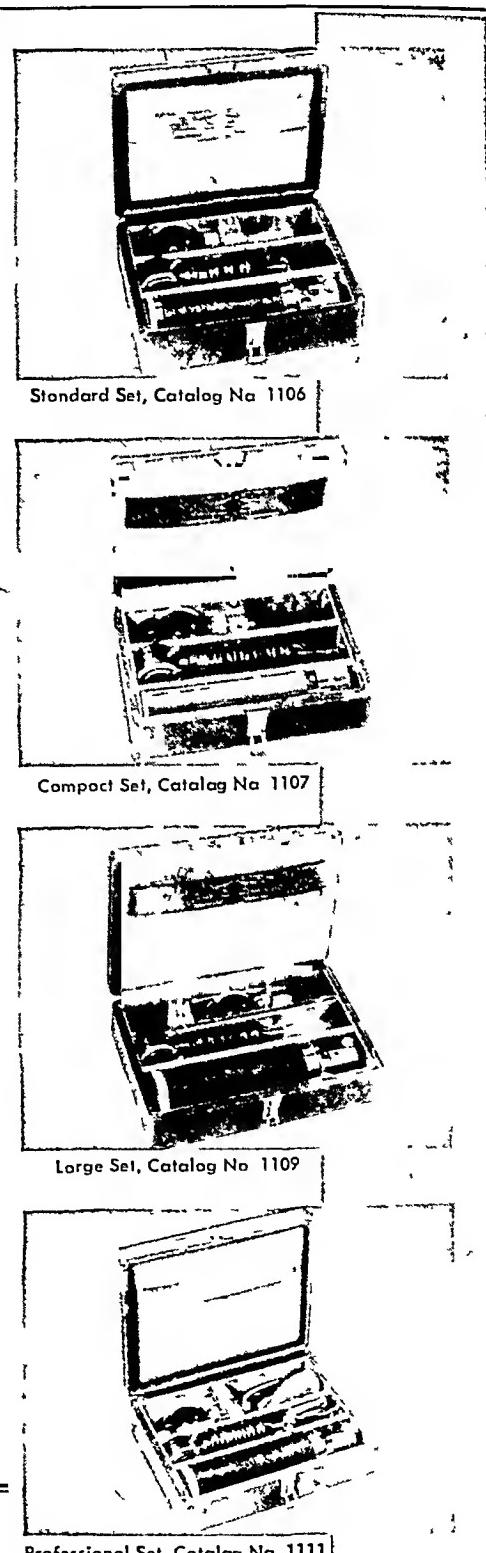
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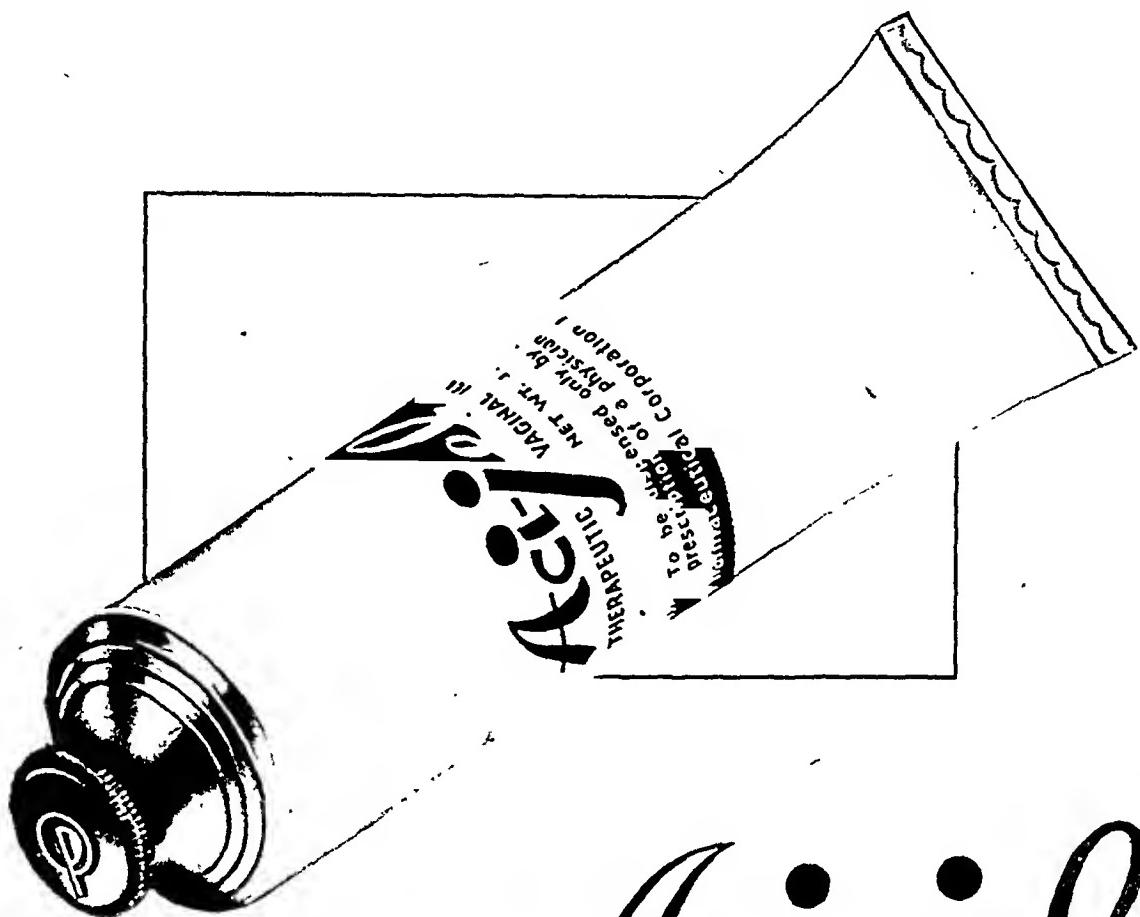


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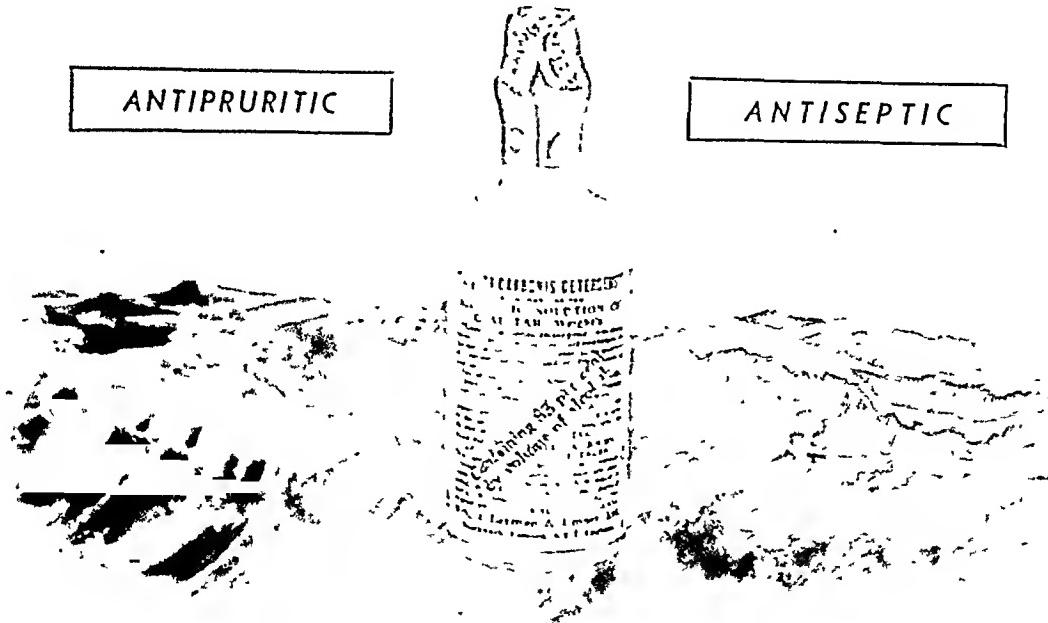
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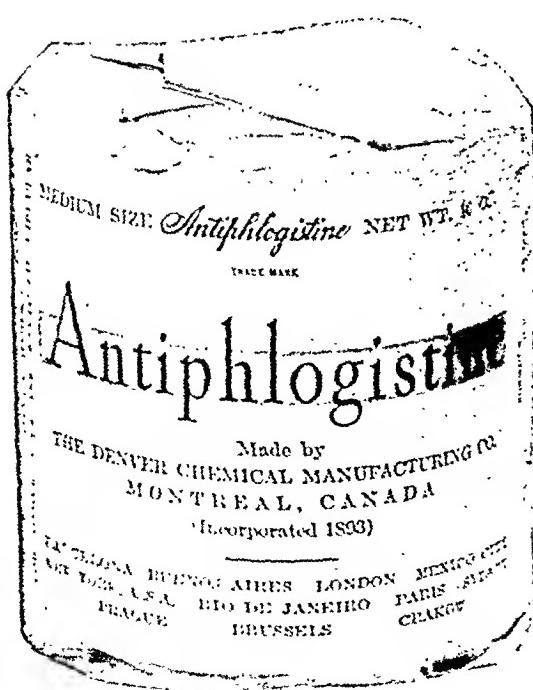
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*Fries, E. C. and Hellebrandt, F. A., *The Influence of Pregnancy on the Location of the Centre of Gravity, Postural Stability, and Body Alignment*: Am. J. Obst. and Gyn., 52: 374-380 (Sept.) 1943.

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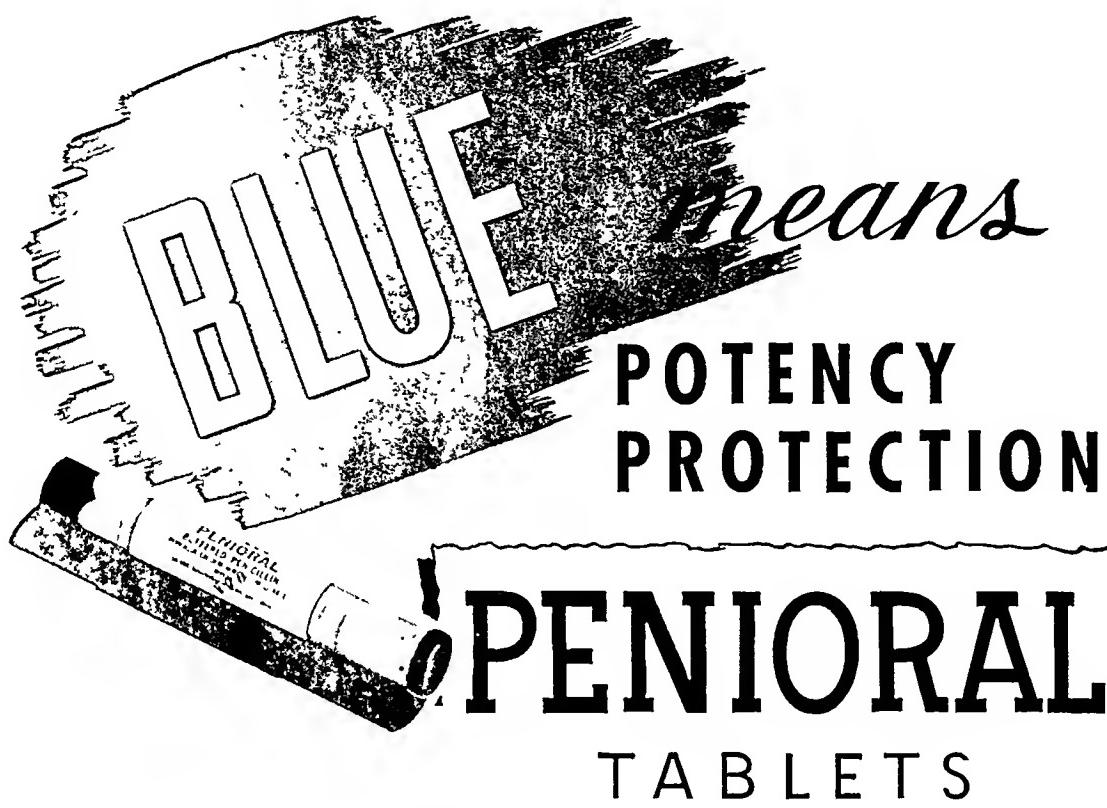
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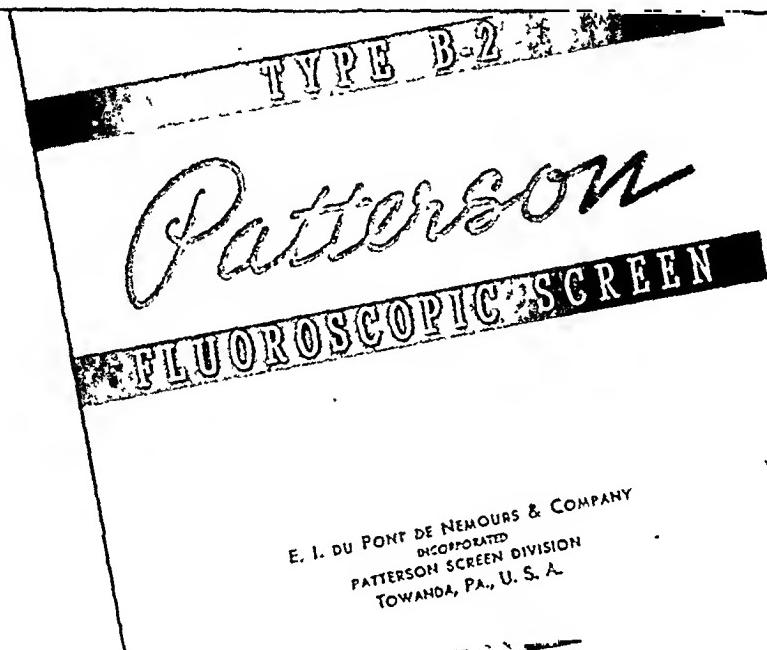
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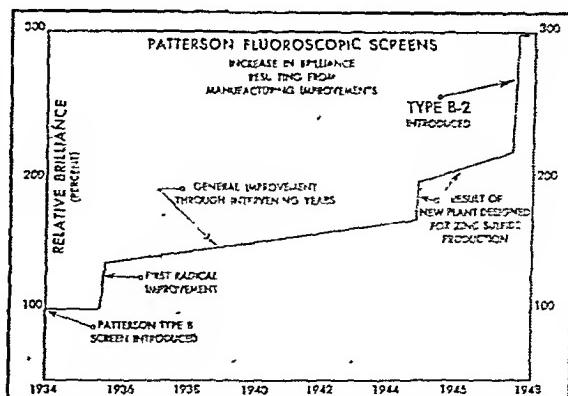
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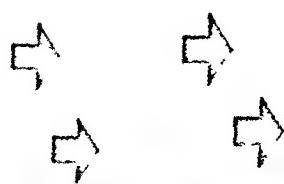
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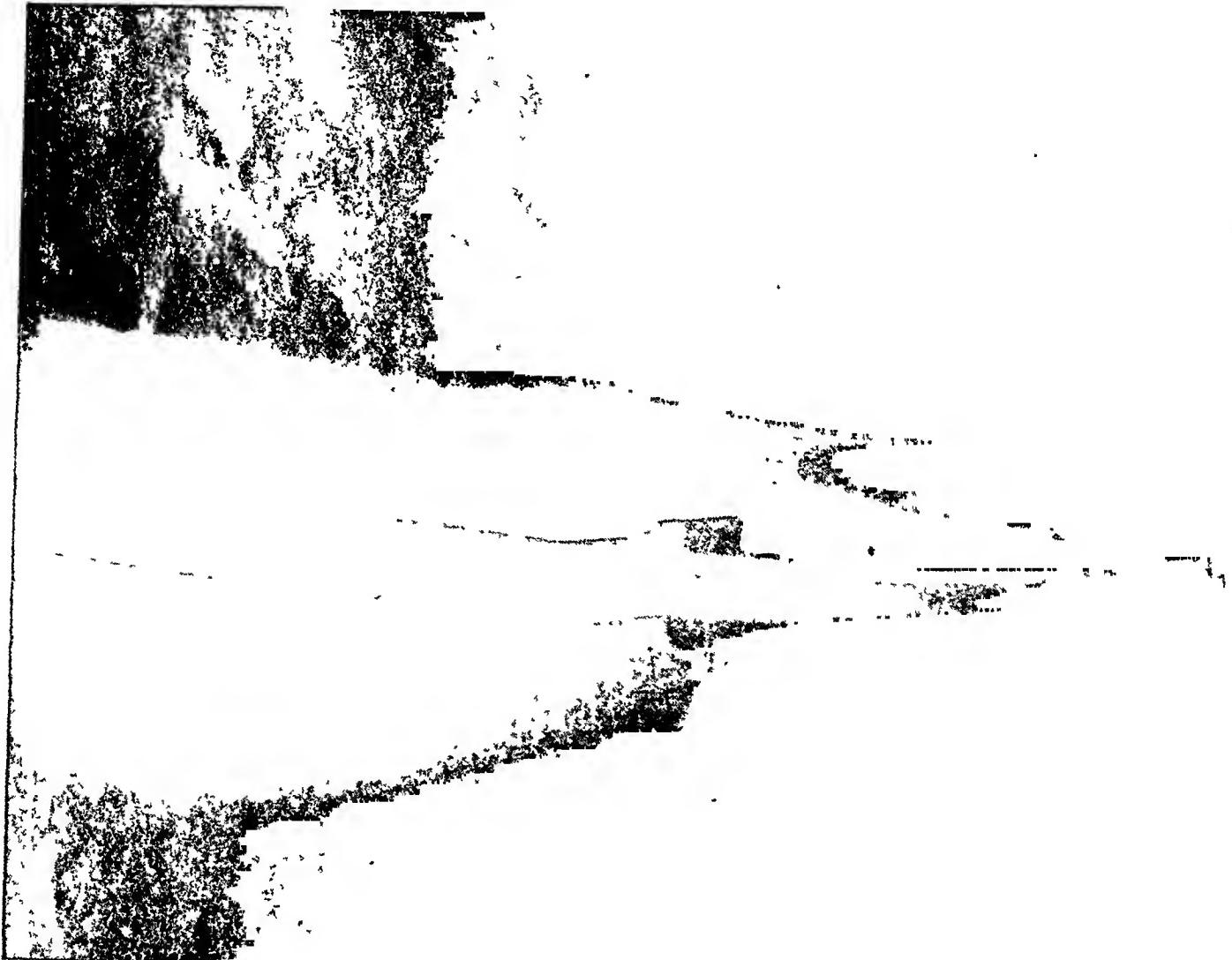
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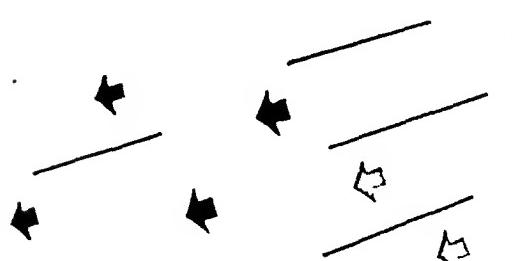
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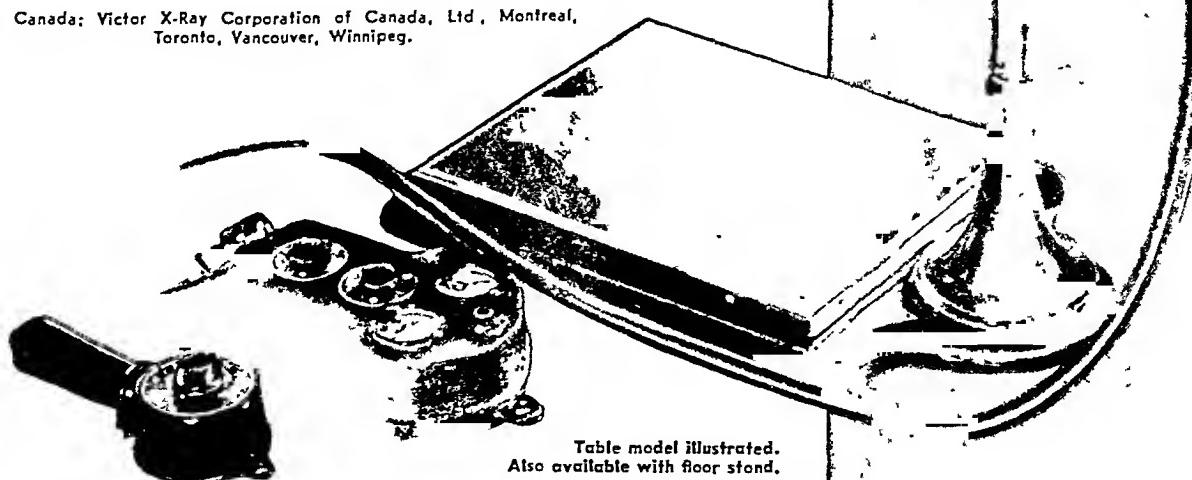
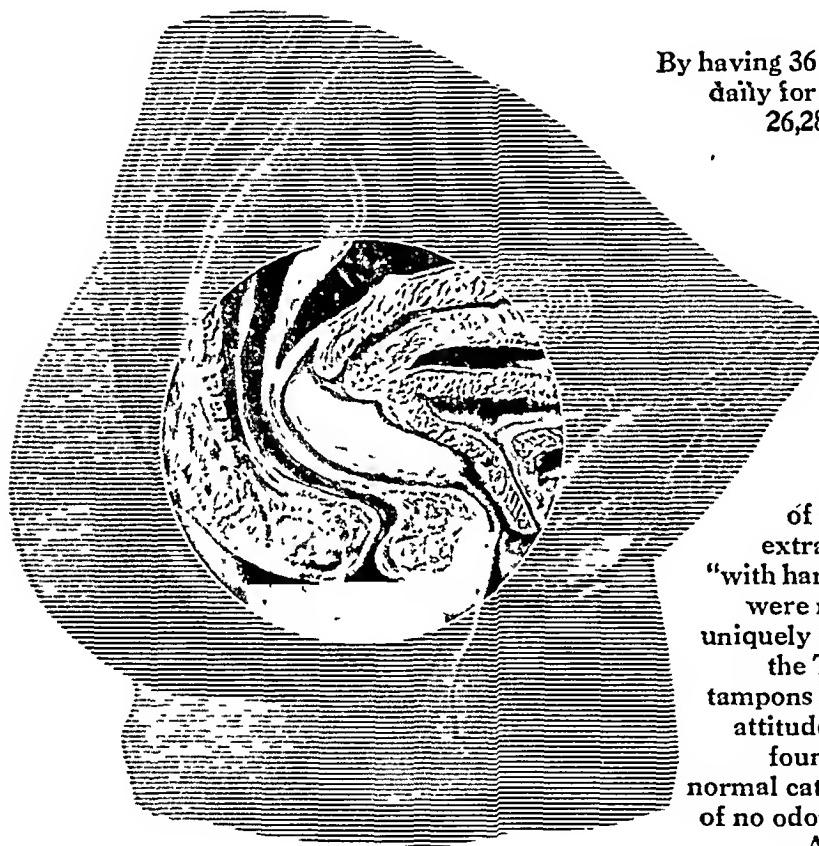


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By having 36 women insert TAMPAX twice daily for a solid year—using a total of 26,280 tampons, or the equivalent of a 200 years' supply for one woman—a leading gynecologist has proved unequivocally that TAMPAX is safe! Continuing bacteriologic studies, biopsies, pH and glycogen determinations and gross visual and pelvic examinations before, during and after TAMPAX usage revealed no evidences of vaginal irritation during this extraordinarily harsh test. In fact, "with hardly an exception, the findings were most favorable."¹ During this uniquely comprehensive investigation, the TAMPAX wearers reported the tampons helpful in their psychological attitude towards menstruation; and found them no impediment to the normal catamenial flow, and productive of no odor associated with the menses.

Authoritative studies by other clinicians^{2,3,4,5} have confirmed these findings, and further corroborated the now indisputable fact that TAMPAX cannot cause irritation, erosion or vaginitis. These are but a few among the many cogent reasons why TAMPAX is more than ever, today, the internal menstrual guard of choice!

TAMPAX

*Three absorbencies:
Super,
Regular
Gentle*

CANADIAN TAMPAX CORPORATION LIMITED,
Brampton, Ontario.

— Please send samples and literature.
— Quote prices on Tampax for office use.

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*Approximate total number of days of menses in year.

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The MARK of EXCELLENCE

FOR OVER 40 YEARS

Making an acetylsalicylic acid tablet is a relatively simple procedure. But making an ASPIRIN tablet involves meeting the exacting standards which have been established in over forty-six years of experience in making this best-known of all analgesics.

In the ultra-modern Bayer Laboratories seventy different tests and inspections are employed to insure the quality, purity, uniformity and fast disintegration for which ASPIRIN tablets are famous.

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"ASPIRIN"
THE ANALGESIC
FOR HOME USE

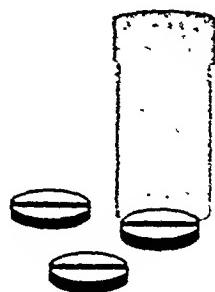
Penicillin by mouth

for adjunctive penicillin therapy



Bristol Penicillin Tablets provide an oral dosage form most useful in the withdrawal period when injection therapy has controlled the more acute stages of an infection and relapse is to be avoided. They are also employed for prophylaxis in tonsillectomy and tooth extraction. Therapeutic levels may be maintained by administering approximately five times the intramuscular dose.

Bristol Penicillin Tablets are available in bottles of 12, each scored tablet containing 100,000 units. They are compounded of crystalline sodium penicillin G buffered with calcium carbonate, and are available for your prescription through your pharmacist.



No refrigeration required

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LABORATORIES OF CANADA, LIMITED

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FOR SAFETY . . .

R

Sulfadiazine with Sodium Lactate-MRT

The *original* Sulfadiazine preparation containing the self-alkalizing factor, Sodium Lactate.

Each 5 cc (1 teaspoonful) contains 0.5 Gm (7.7 grains) of microcrystalline sulfadiazine plus 1.5 Gm (23.1 grains) of sodium lactate. A new delightfully palatable FLUID Sulfadiazine for Oral Use . . .

PLUS

the self-alkalizing factor, Sodium Lactate—RENDERING ADDITIONAL DISTASTEFUL AND COMPLICATED ALKALI THERAPY UNNECESSARY.

Designed for children—equally desirable for adults.

PERFORMANCE STUDY* OF SULFADIAZINE WITH SODIUM LACTATE—MRT

No. of Patients	Dosage	Sulfadiazine Blood Levels	Urine Reaction
43	Equivalent to 0.1 Gm sulfadiazine per Kg during 24 hours	All satisfactory	All neutral to slightly alkaline
<i>Renal Precipitation</i> NONE	<i>Sulfadiazine Crystals</i> NONE	<i>Hematuria</i> NONE	<i>Alkalosis</i> NONE

* Details upon request

Available in bottles of sixteen fluid ounces at leading prescription pharmacies, or direct.

OTHER PRODUCTS OF "MODERN RESEARCH TRENDS" now available to Canadian Physicians:

Alumina Gel—MRT	Sulfamerazine with Sodium Lactate—MRT
Elixir Ferrous Glycinate —MRT	Syrup Vitamin B Complex —MRT
Elixir Vitamin B Complex —MRT	Capsules Ferrous Glycinate —MRT
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Additional information available from Director of Research MRT

THE WINGATE CHEMICAL COMPANY Ltd.

378 ST. PAUL ST. W., MONTREAL, P. QUE.

New vitamin factors in canned foods

THE ROLE of the newer B complex vitamins in mammalian nutrition has been studied by a number of investigators in the last few years. Biotin, pyridoxine, and "folic acid" have been shown by animal experiment to be essential (1).

"Folic acid" has also been reported as effective in the treatment of sprue and certain other types of human anaemia (2, 3).

While the physiological properties and human requirements of these new vitamins are not fully understood or

completely established, they will probably be elaborated in the near future.

In anticipation of that time attention is being directed to the occurrence of these factors in foods.

Tabulated below are the amounts of these nutrients found in representative canned foods (4).

It is planned in future work to develop more complete information regarding the biotin, pyridoxine and "folic acid" values of this important class of foods.

Pyridoxine, Biotin, and "Folic Acid" Contents of Canned Foods

(Recalculated in terms of four-ounce (113 grams) servings.)

Product	No. of Samples	Pyridoxine	Biotin	'Folic Acid'	
		Average Micrograms Per Serving	Average Micrograms Per Serving	S. Lactis Factor	L. Casei Factor
Asparagus, Green	10	34	1.9	6.6	10.1
Beans, Green	11	36	1.5	3.3	8.7
Carrots	10	25	1.7	1.5	4.6
Corn, Yellow	10	77	2.5	1.9	6.3
Grapefruit Juice	11	16	0.3	0.6	1.4
Peaches	9	18	0.2	0.6	1.7
Peas	10	52	2.4	1.9	5.0
Salmon	10	147	11.1	2.9	7.8
Spinach	10	68	2.6	8.4	23.4
Tomatoes	10	80	2.0	3.0	6.1

(1) Nutrition Reviews 4,163 (1946)

(2) Nutrition Reviews 4,11 (1946)

(3) Am. J. Pub. Health 37,688 (1947)

(4) Journal of Nutrition 31,347 (1946)



AMERICAN CAN COMPANY

KENTVILLE • MONTREAL • HAMILTON • TORONTO • WINNIPEG • VANCOUVER



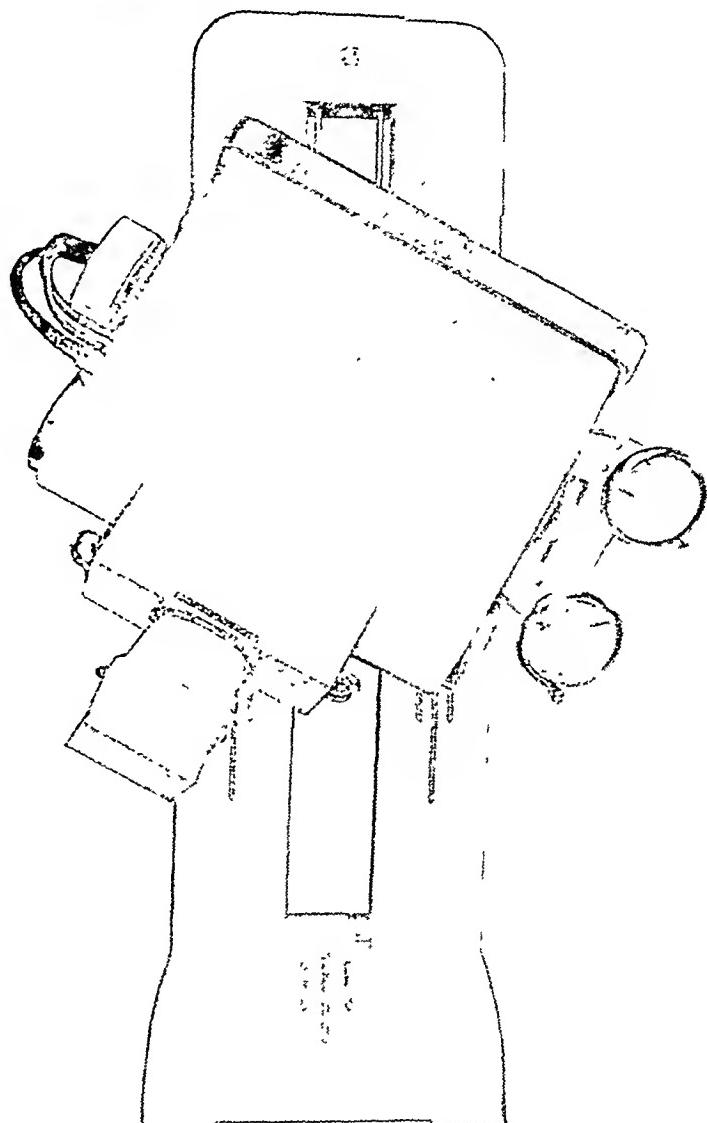
- Exceptional therapeutic range
- Unusually compact . . . easier to handle
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For the treatment of deep, intermediate or superficial lesions . . . here's the latest from Kelley-Koett.

The self-rectifying x-ray circuit, the vastly improved tube, the new, light, compact tubehead and the mechanical flexibility of the tubestand permit safe, accurate manual manipulation of the x-ray beam. (Vertical motion motor driven, if desired.) The 250 KVP-15 MA Unit is easy on the operator as on the patient. The x-ray beam may be focused to various affected parts of the body without the usual compromises in positioning the patient . . . really meets the heaviest demand of busy therapeutic centres.

Vertical Panel Type Control assures precise setting and control of techniques for complete therapeutic range.

THE KELEKET 250 KVP-15 MA THERAPY UNIT



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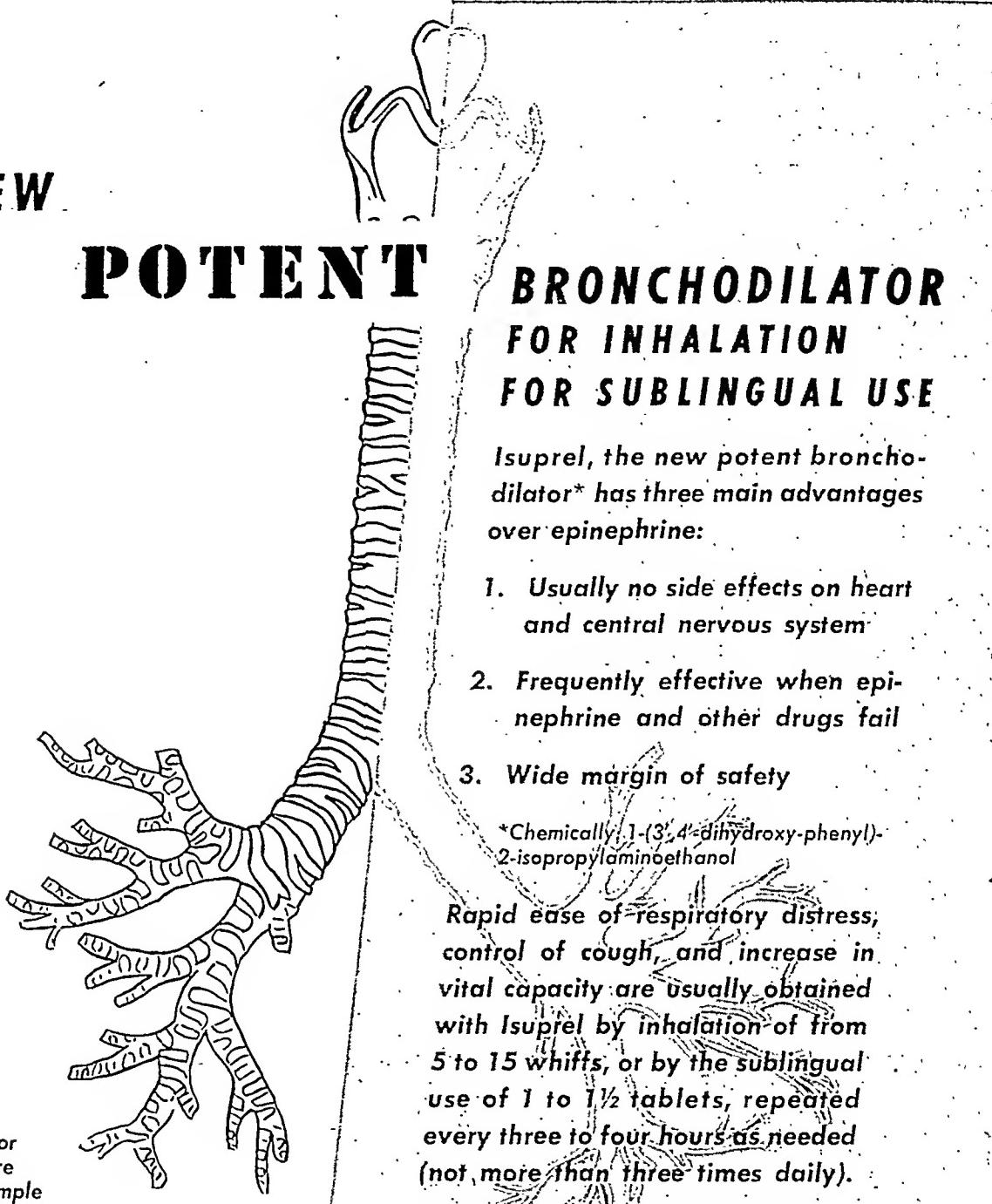
NEW**POTENT****BRONCHODILATOR
FOR INHALATION
FOR SUBLINGUAL USE**

*Isuprel, the new potent bronchodilator** has three main advantages over epinephrine:

1. Usually no side effects on heart and central nervous system
2. Frequently effective when epinephrine and other drugs fail
3. Wide margin of safety

*Chemically, 1-(3,4-dihydroxy-phenyl)-2-isopropylaminoethanol

Rapid ease of respiratory distress, control of cough, and increase in vital capacity are usually obtained with Isuprel by inhalation of from 5 to 15 whiffs, or by the sublingual use of 1 to 1½ tablets, repeated every three to four hours as needed (not more than three times daily).



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literature
and sample

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HYDROCHLORIDE

for Bronchial Asthma

Isuprel, trademark

Bottles of 10 cc. (5 mg./cc.)
for use in any
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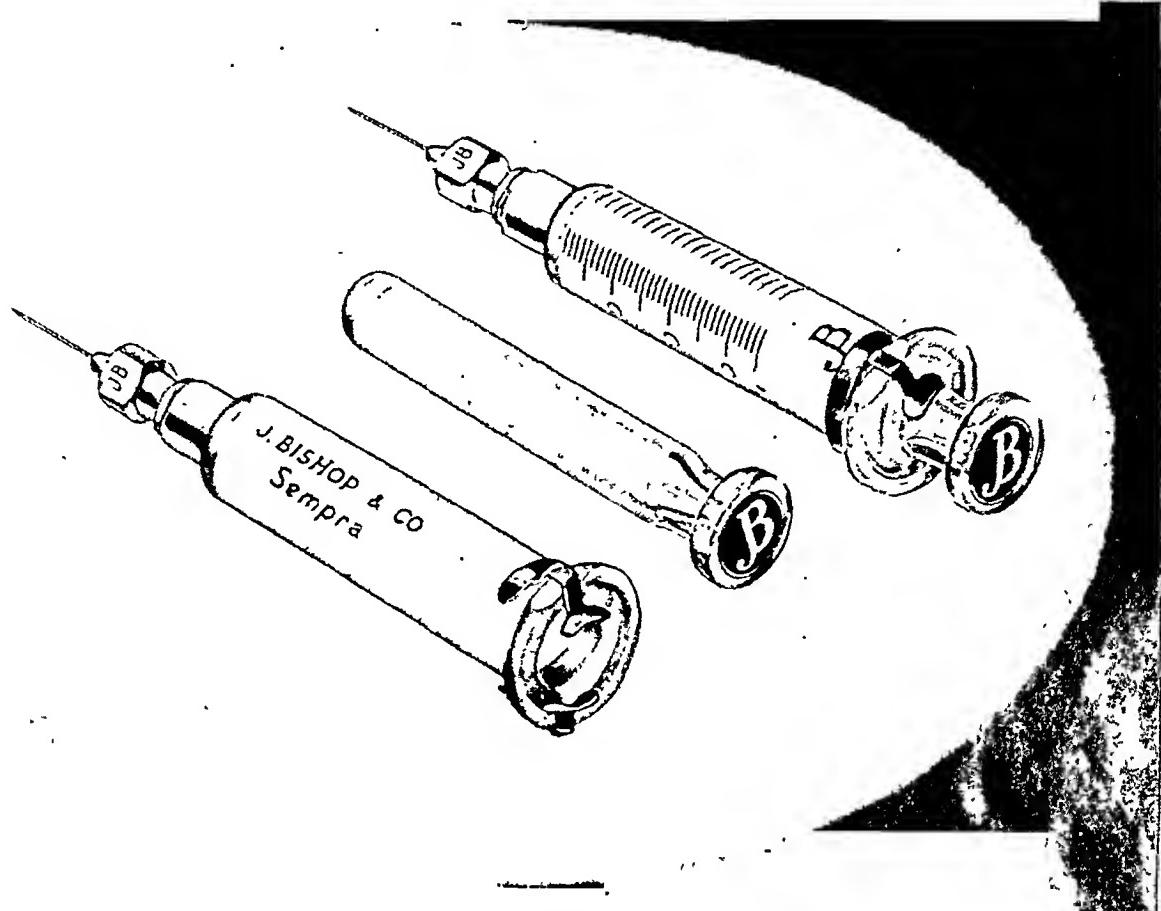
Sublingual tablets of 10 mg.,
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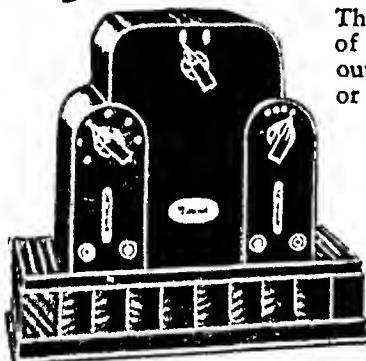
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Cervical Cauterization



N90 SIMPLIFIED CONTROL CAUTERY complete, including Transformer with "Hidden-Shelf" compartment, Illuminated Cautery Pistol, "Gyn-A-Lite" Clip Set, and 3 Cautery Tips (for use on 110 volt, 50-60 cycle, A.C.).

Cervical Cauterization The Modern Method

Articles in leading medical journals emphasize that cervical treatment by electro-cauterization is the Modern Method, as an office procedure without anesthesia. A comparative chart shows the results of treatment by cauterization, coagulation and conization. It points out that cauterization results in a more rapid cure; a more positive cure and greater freedom from complications.

The National Simplified Control Cautery—first choice of discriminating physicians everywhere, provides 14 outstanding features for major operative procedures or office cervical treatments.

MOST COMPLETE Cautery ever developed. Transformer is encased in handsome walnut "Bakelite"; an impressive instrument for the most dignified office.

EASIEST TO OPERATE: Only 3 simple, easy-to-read dials on a single vertical panel.

TWIN CONTROLS for the safe and simultaneous operation of light and cautery.

"DUAL POSITION" CAUTERY PISTOL: Electrodes may be inserted so that edges are in either VERTICAL or HORIZONTAL position. Patented "SWITCH-LOCK" is an invaluable aid during major surgery. Detachable illuminator may be located below the field of vision — entirely out of the line of sight.

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BENZOCAINE
TYROTHRICIN
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Lokocillin Lozenges

Saliva supplies the vehicle for a new concept in the treatment of oral infections, pain relief **before** elimination of the cause.

Benzocaine, a potent local anesthetic, and two active antibiotics team up in Lokocillin to bring sure relief to mouth and throat infections. Benzocaine spreads soothing anesthesia over painful surfaces while tyrothricin and penicillin seek the cause.

Lokocillin Lozenges offer a strong antibiotic combine,—tyrothricin for surface bacteria; penicillin to soak into deep-seated pockets and folds. Prescribe this pleasant tasting combination on gram-positive infection and note the swift relief.

ADVANTAGES

Lokocillin Lozenges —

1. Contain benzocaine—to soothe inflamed membrane.
2. Contain tyrothricin — for swift action against surface bacteria.
3. Contain penicillin — to destroy deeply rooted organisms.
4. Are palatable — ingredients are pleasantly flavored.
5. Have two strengths — for mild or severe infections.

FORMULAE

LOKOCILLIN 1000

LOKOCILLIN 5000

per tablet

Calcium penicillin	1000 I.U.	Calcium penicillin	5000 I.U.
Tyrothricin	1 mg.	Tyrothricin	1 mg.
Benzocaine	7½ mg.	Benzocaine	7½ mg.

METHOD OF USE

Lokocillin 1000 or 5000 should be allowed to dissolve slowly in the mouth. They are effective in treating all gram-positive oral infections accessible to saliva.

Science at the Service of Medicine.

F R A N K W. H O R N E R L I M I T E D
Montreal

Canada

In Angina Pectoris



In Angina Pectoris the incapacitating symptoms frequently may be prevented by appropriately regulated administration of a vasodilator having a sustained effect. This type of medication may be indicated:

FOR THE PERSON

- who suffers "indigestion" and "gas" after a heavy meal.
- who is compelled to stop and rest when climbing a flight of stairs.
- who is stricken with precordial pain on unusual exertion or emotion, or when exposed to cold.

The vasodilatation produced by Erythrol Tetranitrate Merck (Erythrityl Tetranitrate Tablets U.S.P.) begins about 15 minutes after administration, and lasts from 3 to 4 hours.

Experience has shown that the acute attack of anginal pain is most readily relieved by the prompt removal of the provocative factor, and by the use of organic nitrates or nitrites. For prophylactic purposes—to control anticipated paroxysms—the delayed but prolonged action of Erythrol Tetranitrate is reported as especially useful. Erythrol Tetranitrate, because of its slow and prolonged action, also is of value for preventing nocturnal attacks.

ERYTHROL TETRANITRATE MERCK

(ERYTHRITYL TETRANITRATE U.S.P.)

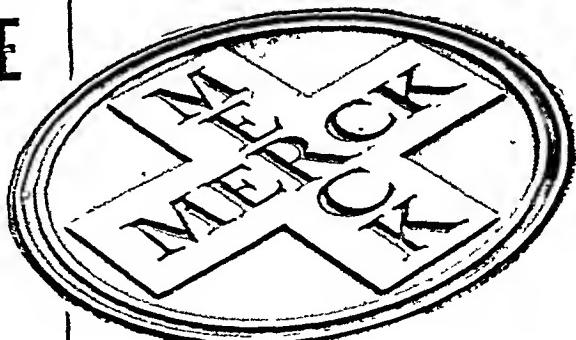
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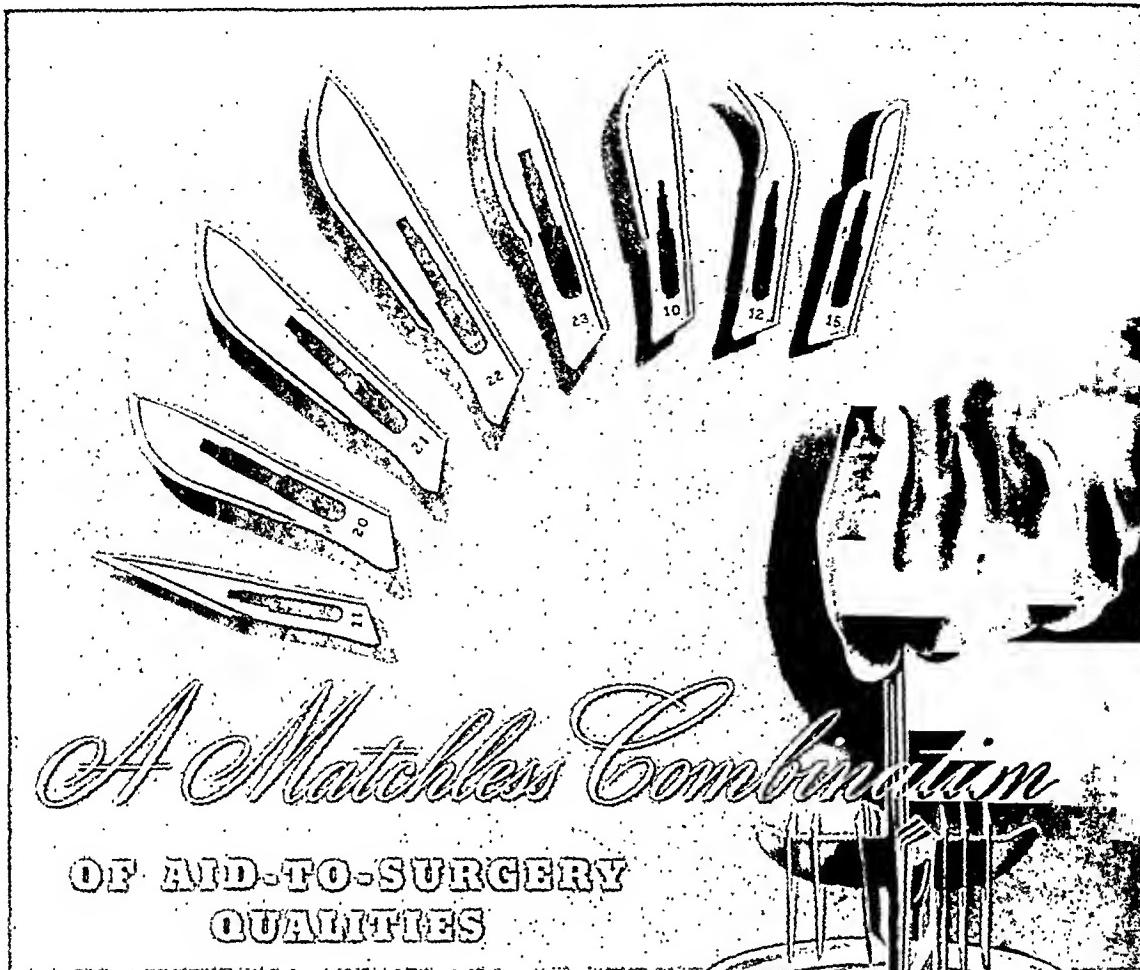
For your head-cold patients

PAR-PEN provides the quick, lasting vasoconstriction of Paredrine and the potent anti-bacterial action of penicillin. PAR-PEN is one of the most effective agents you have for clearing up *both* intranasal congestion *and* infection.

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The penicillin-vasoconstrictor combination
for intranasal use

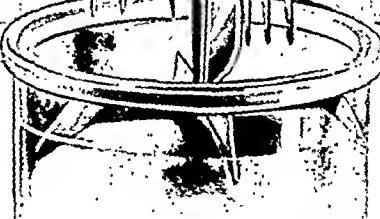
Par-Pen



Critical surgeons realize that blade dependability is predicated upon three vital characteristics — uniform sharpness throughout the entire cutting edge, adequate strength, and a degree of rigidity best calculated to resist lateral pressure.

RIB-BACK BLADES

excel in all three essential requisites. They provide matchless uniformity . . . each and every blade assuring cutting efficiency at its best. Their uniformly superior strength is a matter of record. Their degree of rigidity is reportedly highly satisfactory to the surgeon . . . a matchless combination of aid-to-surgery qualities.



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Anhydrous

The Ideal
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"Eucerin" consists of a mixture of solid alcohols of the meta-cholesterol series, (which closely resemble natural skin secretions) and neutral hydrocarbons.

"Eucerin" forms a stable emulsion with as much as 200% of an aqueous solution or compound. Ointments prepared with a "Eucerin" base penetrate below the surface of the skin, thus providing an enhanced therapeutic effect.

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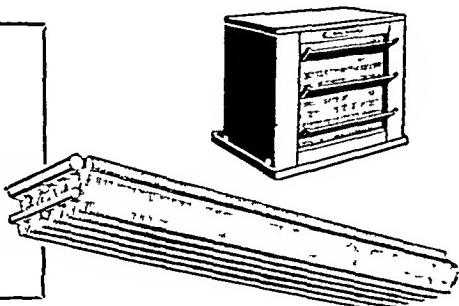
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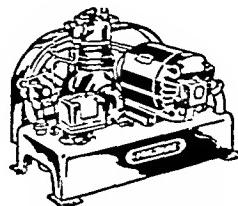
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*and Doctors find they can trust
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- “Farmer’s Wife” is widely accepted as an ideal milk for infants or children.

Produced from the specially selected cow's milk of a Tuberculosis Accredited Free Area — “Farmer’s Wife” is homogenized, irradiated and sterilized. The lower fat content makes it easier for infants to digest . . . and it's an excellent source of Vitamin D — 400 International Units per reconverted quart. Both normal and delicate babies and children thrive on “Farmer’s Wife”.

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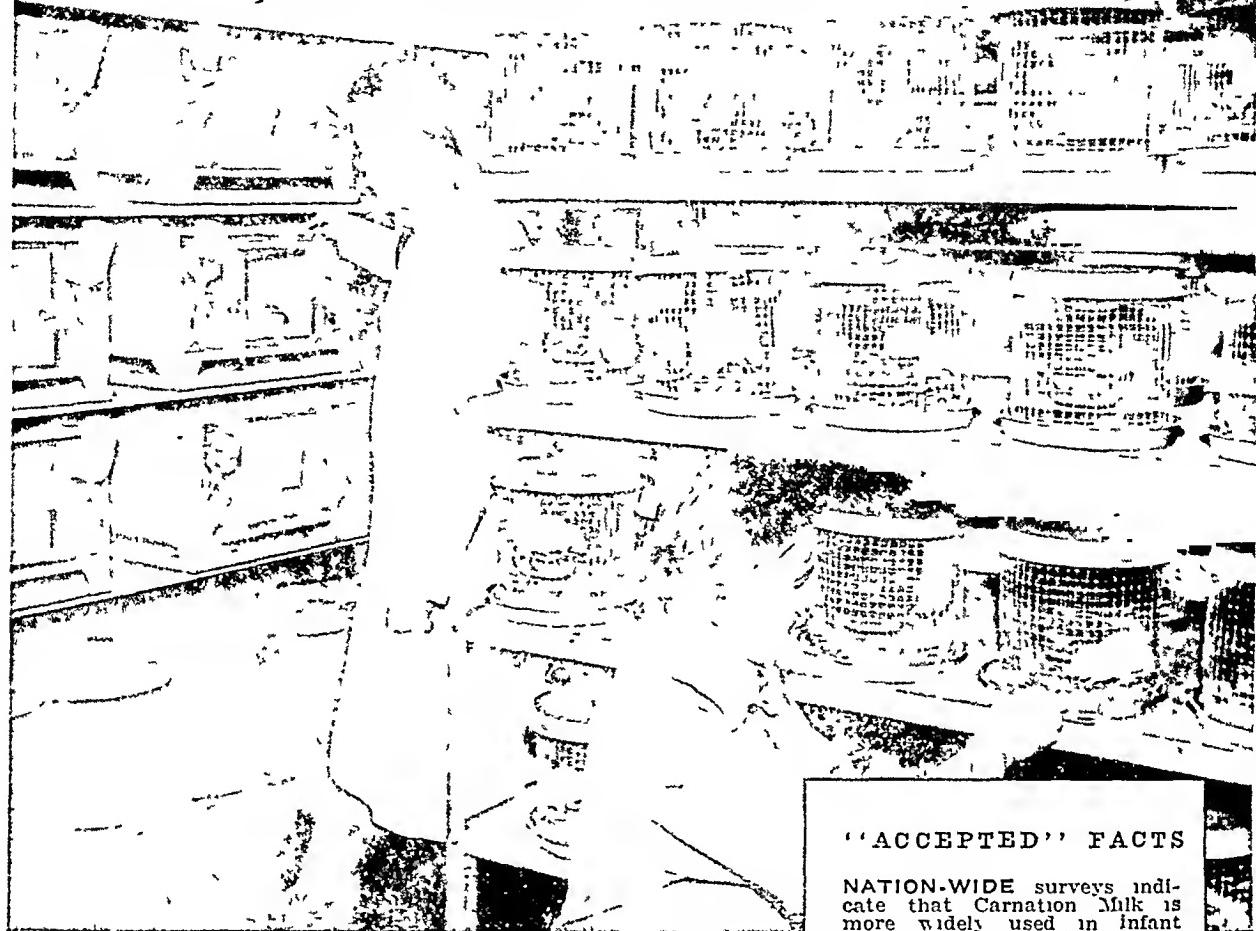
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and pocket formula card.*



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Test-tubes with talk



YEAR IN and year out, nutritional studies and bio-assays of far-reaching significance are in constant process at Carnation's Research and Development Department in Milwaukee. Hundreds of rats are used annually in checking every aspect of the nutritive value of Carnation Evaporated Milk, for infant feeding and special diet uses. . . . This Milwaukee laboratory is the center of Carnation research activity, but it is supplemented by many other Carnation laboratories throughout the country, all devoted to maintaining and advancing the quality of Carnation Milk—"the milk every doctor knows."

the Milk **EVERY DOCTOR KNOWS.**

"ACCEPTED" FACTS

NATION-WIDE surveys indicate that Carnation Milk is more widely used in infant feeding than any other brand of evaporated milk. It is:

HEAT-REFINED—forming fine, soft, flocculent, low-tension curds

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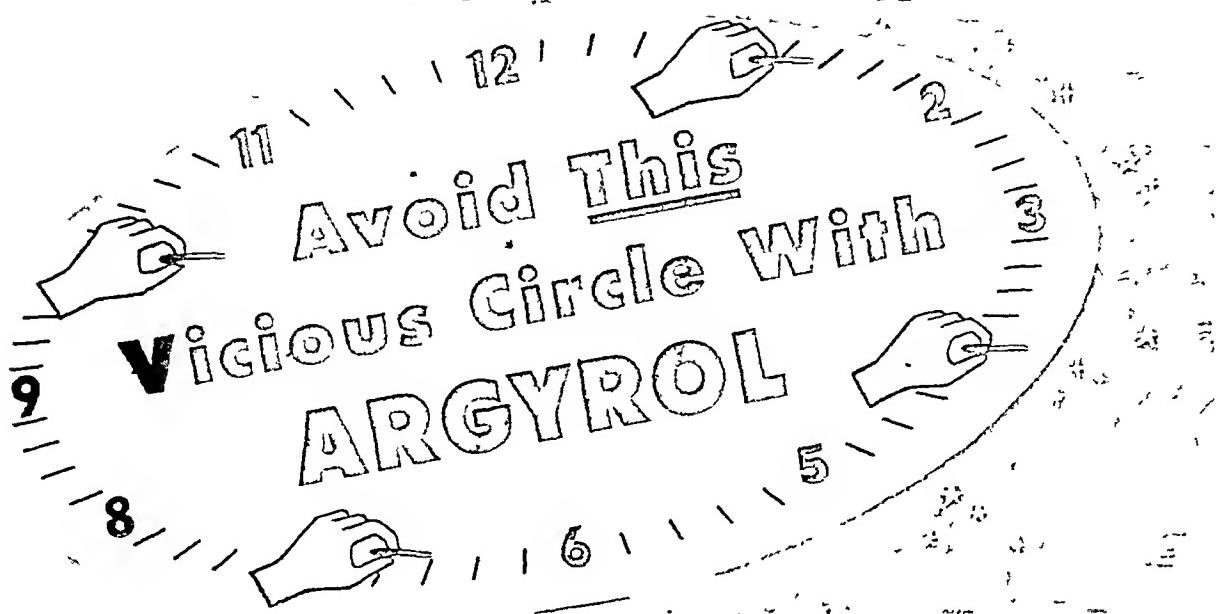
IRRADIATED—to a Vitamin D potency of 400 Int. units per pint

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In treating Para-nasal Infection



... Decongestion Without Rebound

It becomes increasingly evident that the compensatory congestion following use of many vasoconstrictors is creating the seeming necessity for repeated use—thus creating the vicious circle which leads to Rhinitis Medicamentosa.

This undesirable result is avoided by following the ARGYROL Technique, which attains decongestion *without rebound*, thus more readily restoring normal function.

The Argyrol Technique*

1. The nasal meatus . . . by 20 per cent ARGYROL instillations through the naso-lacrimal duct.
2. The nasal passages . . . with 10 per cent ARGYROL solution in drops.
3. The nasal cavities . . . with 10 per cent ARGYROL by nasal tamponage.

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2. Definitely bacteriostatic, yet non-toxic to tissue.
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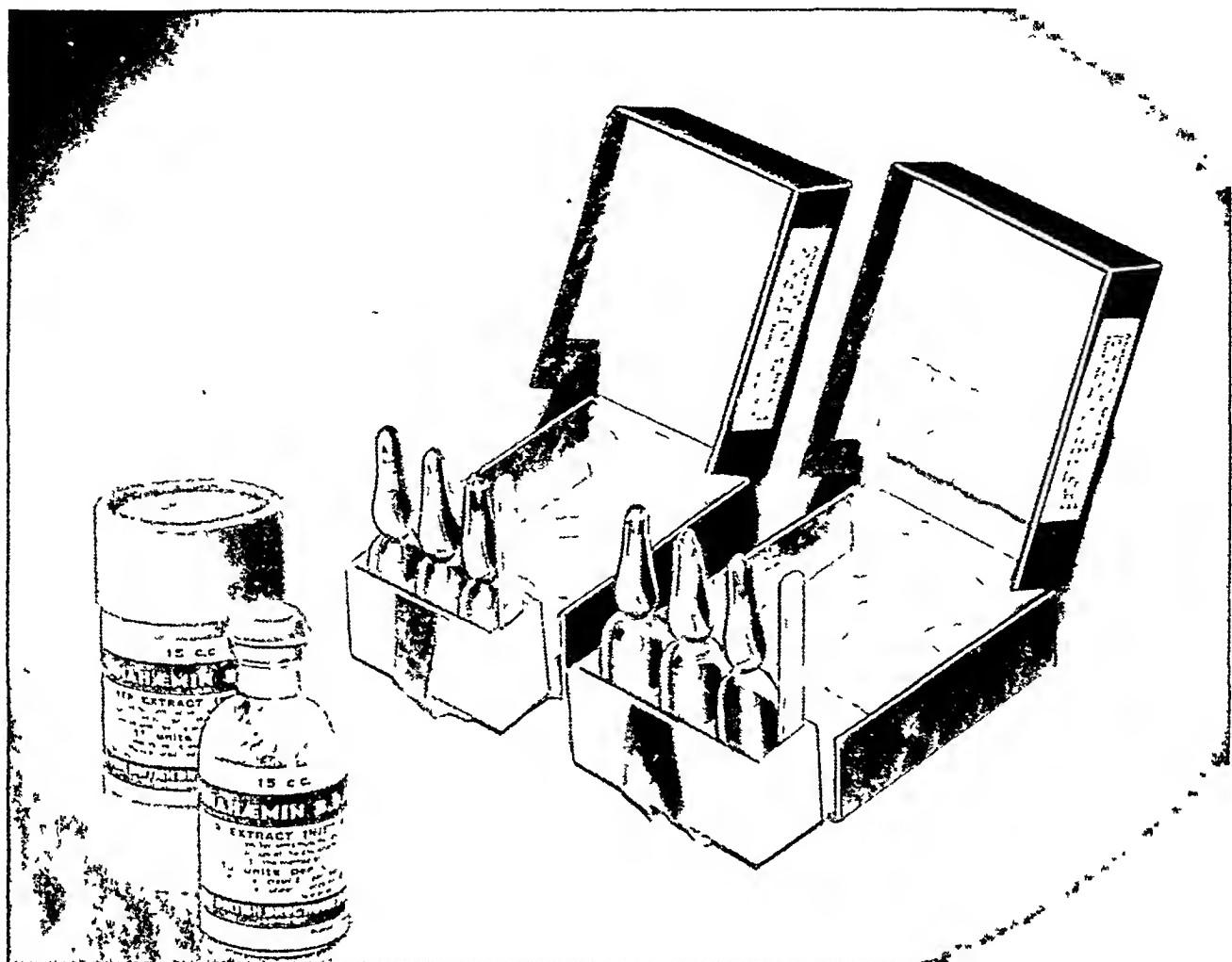
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ARGYROL the Medication of Choice in treating Para-nasal Infection

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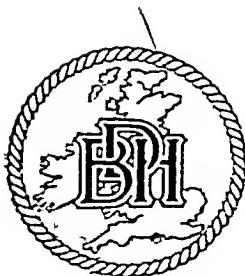
Yet possesses all the Erythropoietic properties of
relatively-unrefined Liver Preparations

ANAHAEWIN B.D.H.

(Liver Extract Injectable 15 units per c.c.)

- The principal indications for Anahaemin B.D.H. are the treatment of pernicious and other macrocytic anaemias, and the prevention of the onset of subacute combined degeneration of the cord as well as the correction of all the remediable symptoms of this syndrome if it has become established.
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Heinz Strained Foods may be safely recommended because they are thoroughly cooked uniform fine particles with the coarse indigestible fibre removed. Being smooth, they cause a minimum of mechanical irritation to sensitive digestive systems. Not only are they easily digestible, but in general their nutritional value is very good. The wide assortment of Heinz Strained Foods available provide your patients with more variety and aid in giving nutritional balance to restricted diets.

It is beyond the scope of the H. J. Heinz Company to include specific diets for special and pathological conditions in any literature. But the Heinz Nutritional Charts are prepared especially for the guidance of physicians, dentists, nutritionists, dietitians, and public health workers, and have proved useful in devising and prescribing diets for children, the sick and convalescent, under and over-weight persons and normal individuals needing a well-balanced diet. These charts are available for professional use by writing to H. J. Heinz Company of Canada Ltd. 420 Dupont Street, Toronto 4, Ontario.

HEINZ STRAINED FOODS

Uses

(1) Soft Diets—for Special and Pathological Cases

(A) INABILITY TO MASTICATE OR SWALLOW

1. Sore Mouths or Throats

- (1) Tooth Extractions
- (2) Broken Jaws
- (3) Tonsillectomies
- (4) Infections
 - (a) Trench Mouth
(Vincent's Angina)
 - (b) Severe Septic Sore Throat
 - (c) Abscesses
 - (d) Quinsy

2. Paralysis

3. Senility

4. Extreme Mental Deficiency

5. Obstruction of Esophagus

- (1) Tumor
- (2) Stricture (Lye Burns)

(Strained foods may be incorporated in tube feedings.)

(B) GASTRO-INTESTINAL CONDITIONS

1. Gastric Ulcer

2. Gastric Cancer

3. Gastritis

4. Intestinal Ulcer

5. Enteritis (Colitis)

6. Cholecystitis

7. Diverticulosis

8. Constipation

- (1) Spastic
- (2) Mild Atonic
 - (a) Infants
 - (b) Convalescents

9. Vomiting in Pregnancy

10. Cyclic Vomiting

11. Amebic Infections

(C) CASES WHERE BURDEN ON DIGESTIVE SYSTEM SHOULD BE LIGHT

1. Convalescence

- (1) Febrile Conditions
 - (a) Scarlet Fever
 - (b) Measles
 - (c) Diphtheria
 - (d) Typhoid
 - (e) Undulant Fever
- (2) Operations

2. Exhaustion

3. Old Age

4. Diseases of Heart

5. Nervous Indigestion

(2) Convenience in Supplying Essential Nutrients where a soft diet is not demanded

A. Invalids

E. Diabetes

B. Convalescents

F. Nephritis

C. The Aged

G. Epilepsy

D. Pernicious

H. Pregnancy

Anemia

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*"Doctor, I can tell you about Dryco
in half a minute!"* exclaimed Elsie the Borden Cow.

"New, improved Dryco is a flexible, scientifically adjusted milk food devised specifically for infant nutrition.

"It's made from spray-dried superior quality whole milk and skim milk with no non-milk substances except pro-vitamin A and vitamin D.

"Potencies of vitamins A, B₁, B₂, and D, are ample.

"Standard Dryco formulas supply 40% more protein and 50% less fat than standard whole milk formulas.

"Dryco is soluble in cold or warm water. It may be used with or without carbohydrate, with milk or with milk and carbohydrate. And druggists have it.

"There!—Did you time me doctor?"

New Improved DRYCO—high-protein—low-fat infant food

Borden's Formula Foods

- C.M.P. Powdered Protein Milk ● Borden's Evaporated Milk
- C.M.P. Powdered Lactic Acid Milk ● Klim Powdered Whole Milk
- Mull-Soy—emulsified soy bean food



THE BORDEN COMPANY, LIMITED.

Formula Foods Department—Spadina Crescent, Toronto 4, Ontario

Professional literature available to doctors upon request

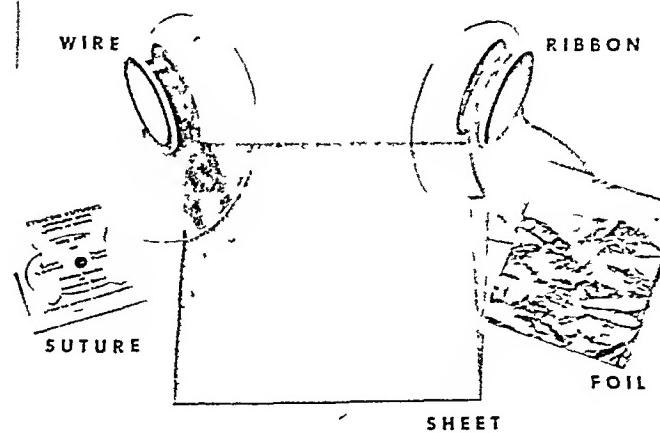
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*Olson, C T. "The Place of Tantalum in Surgery." *Industrial Medicine*, 13 917, November, 1914.



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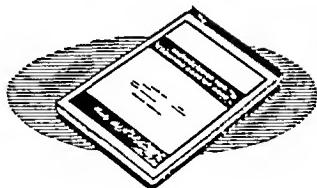
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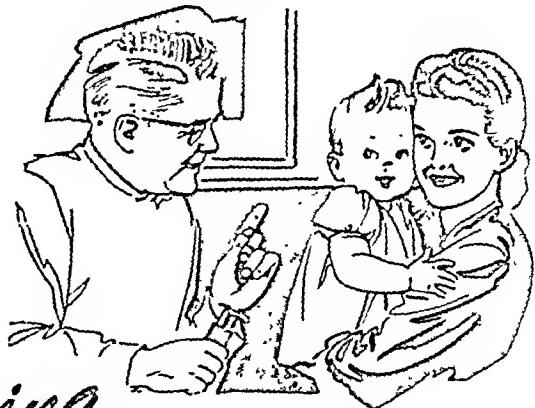
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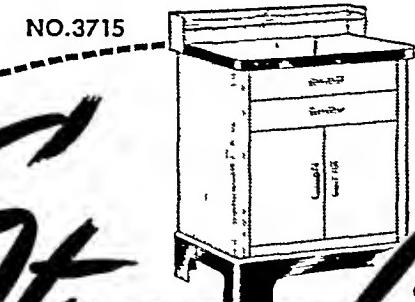
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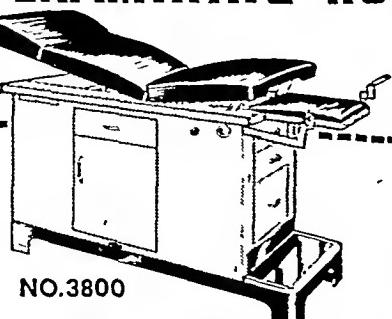


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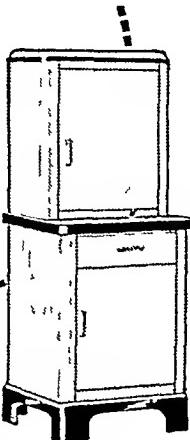
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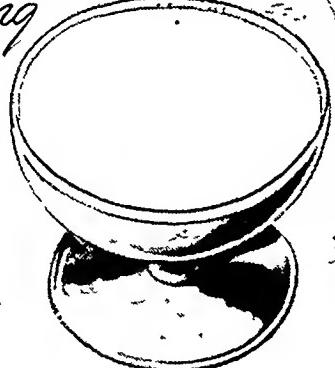
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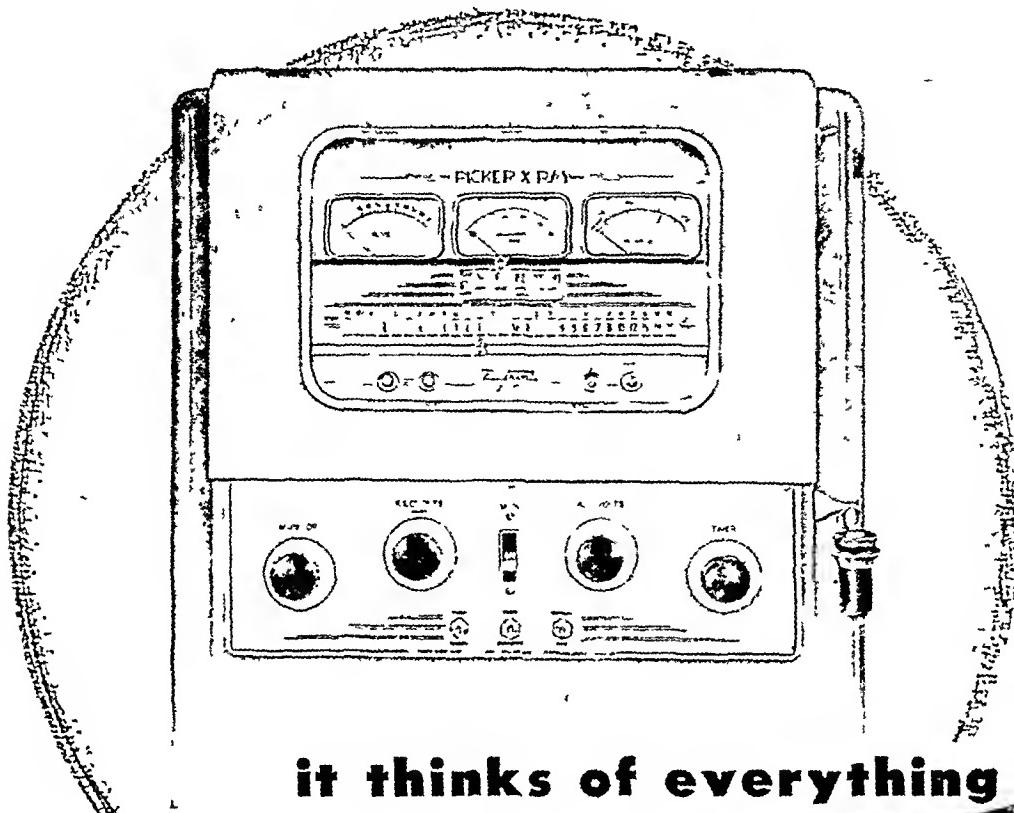
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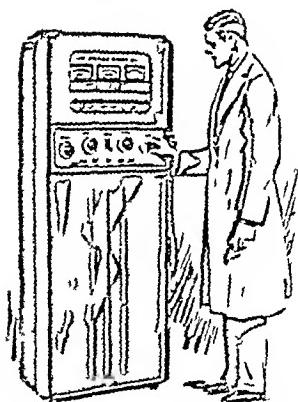
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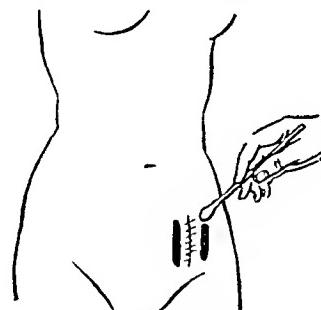
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† Pat. Applied for

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*accepted ulcer therapy...



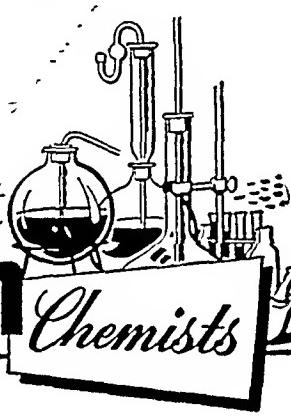
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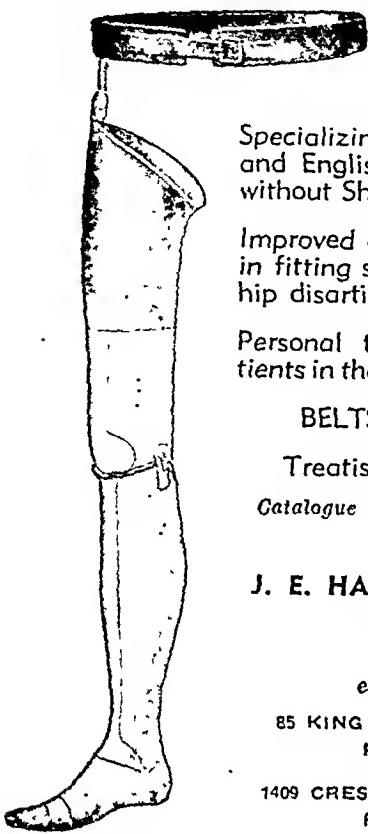
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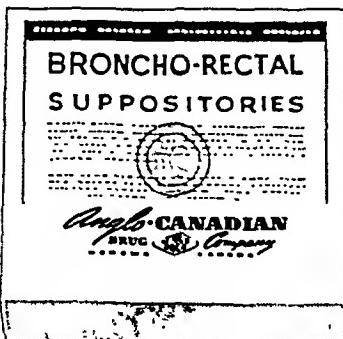
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 Each suppository imparts the approximate
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*E. B. Troxil, Proc. Fed. A. Soc. Exp. Biol. 1947, 6, 378.

**A. C. Kirchhoff and N. A. David, Ibid, 1947, 6, 345.

Literature on request.

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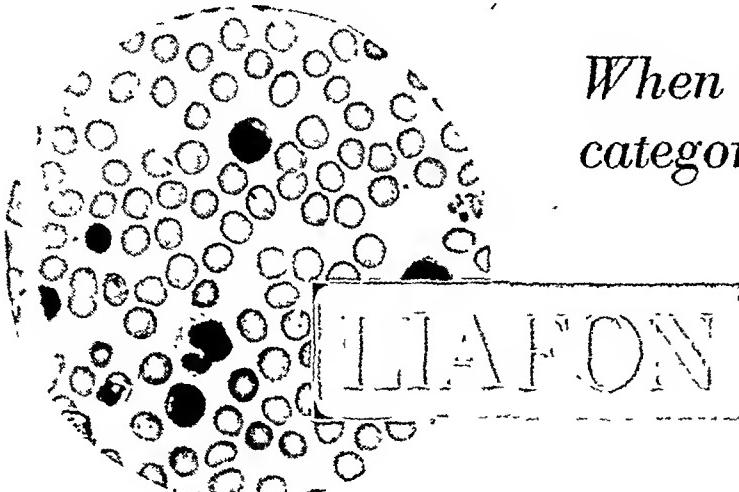
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Desiccated Liver 0.5 Gm. (Approx. equivalent to 2 Gm. whole fresh liver)	*6 Gm. fresh liver	*12 Gm. fresh liver
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SQUIBB MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

YOU GRIN AND BEAR IT WHEN...



*Someone you meet at a party
starts looking for free medical advice*

...But some things you don't have to bear

Wouldn't you know it? Things like this always seem to happen to doctors ... and they take it good-humoredly in stride. But there are some personal annoyances you *don't* have to put up with. You *don't* have to let your concern about the welfare of others make you shrug off *your own* discomforts—such as annoying skin irritations.

After all, you and thousands of members of the Medical Profession recognize Noxzema's ability to soothe many of the common skin irritations *other* people complain about. Isn't it reasonable to treat yourself with the same common sense care you give your patients? Why grin and bear it... when Noxzema can save you so many uncomfortable moments?

1. Use medicated Noxzema for your face when it's irritated by exposure to bad weather. And use Noxzema for

shaving, as a base for regular lather, or as a brushless shave cream. It helps protect sensitive skin.

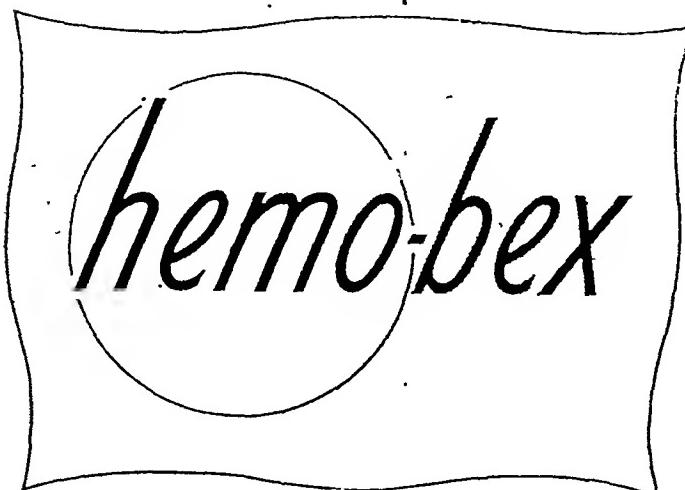
2. Use Noxzema for your hands when they're bothered by winter chapping or roughened and red from scrubbing. It's soothing—helps heal tiny cracks.

3. Use Noxzema for your feet when they're tired and burning after a hard day. It's greaseless, cooling, won't stain.

For Your Information

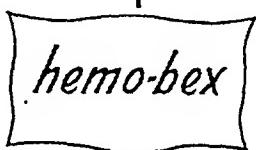
Regular Noxzema Skin Cream is a modernization of Carron Oil, fortified by adding Camphor, Menthol, Oil of Cloves and less than $\frac{1}{2}\%$ of Phenol in a greaseless, solidified emulsion. Its reaction is almost neutral—the pH value being 7.4.

Where an antipyretic and/or antipsoric is indicated, as in the case of painful skin irritations of various types—itching rashes and burns—mildly medicated greaseless Noxzema can be safely recommended and prescribed for your patients.



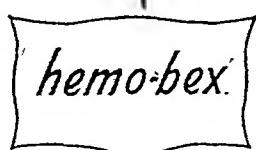
REMARKABLY EFFICACIOUS
DELIGHTFULLY PALATABLE
ESPECIALLY INDICATED FOR
INFANTS AND CHILDREN

the NEW, perfectly balanced tonic



DOSAGE: Children, 1 to 3
teaspoonfuls daily. Adults,
3 dessertspoonfuls as needed.

SUPPLIED in bottles of
6 oz.



HEMO-BEX is a new, highly palatable, nutritional tonic with a wonderfully balanced formula which provides the benefits of such vitamin B. Complex factors as Vitamins B₁ and B₂, with standard reconstructive agents which help. . . .

INFANTS AND CHILDREN GROW TALLER, HEALTHIER
ADULTS FEEL BETTER, MORE ENERGETIC
PREGNANT WOMEN FEEL STRONGER, LESS NERVOUS

HEMO-BEX is a reliable bone and tooth builder, blood regenerator, tonic stimulant, an aid to better nervous, muscular, digestive, eliminative functions; improves resistance toward respiratory and other infections.

COMPREHENSIVE FORMULA:

The principal constituents of HEMO-BEX per each c.c. are:	
Vitamin D (Irradiated Ergosterol)	83 I.U.
Thiamin Hydrochloride	0.13 mg.
Riboflavin	0.20 mg.
* Pyridoxine	0.22 mg.
* D-Pantothenic Acid	1.10 mg.
Blood Extracts, free from albumen	0.02 gm.
Thymus, hydro-alcoholic extract (corresponding in fresh organ to)	
Suprarenal extract (corresponding in fresh organ to)	0.05 gm.
Calcium Chloride	0.001 gm.
Glycerophosphate of Iron.	0.0005 gm.
Manganese Nucleinate and Excipient	Q.S.

* The significance of these vitamins in human nutrition is not as yet established.

anglo-french

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Where a deficiency of Vitamin B exists oral therapy with B-SAN COMPLEX is indicated

B-SAN COMPLEX WITH IRON

C.T. Tablets

each containing:
3.5 mgs. Vitamin B₁ (Thiamin)
0.66 " " B₂ (Riboflavin)
10.0 " Nicotinic Acid
0.2 " Vitamin B₆
0.6 " Pantothenic Acid
2 grains Ferrous Sulphate

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3 grains Ferrous Sulphate
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10.0 " Nicotinic Acid
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0.6 " Pantothenic Acid

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DIAGNOSTIC SETS

Standard Gowlland Diagnostic Sets (as well as many other instruments) have been supplied as standard equipment for the Armed Forces of the British Dominions and Colonies, and many of the Allies.

Manufactured in very large numbers by a firm with over half a century's experience of Surgical Instrument making, Gowlland brand Instruments have been produced in that corner of England known as the Front Line and have been fully proved by successful use under Active Service conditions throughout the War.

Obtainable from all Surgical Supply Houses.

Gowlland
electric diagnostic instruments

Made in England

STOCKED BY BRANCHES OF THE STEVENS COMPANIES

DIPARCOL

R. P. 2987

*has already transformed completely
the entire existence of hundreds of*

PARKINSON CASES

*because it controls in a striking manner
all the symptoms of paralysis agitans:*

MUSCULAR SPASM - RIGIDITY - TREMORS OCULOGLYRIC CRISES

- DIPARCOL is a synthetic agent (diethylaminoethyl-N-dibenzoparathiazine hydrochloride) that shows both parasympatholytic and sympatholytic actions. It is much more potent than the solanaceous drugs used up to the present time. The toxicity of DIPARCOL is low and side-effects which may be observed at the beginning of treatment are usually the result of increasing the dose too rapidly.
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- The posology of DIPARCOL should be slowly and gradually progressive. To this end, coated tablets of 0.05 Gm. and 0.25 Gm. are available. DIPARCOL is also supplied in 5 c.c. ampoules of 0.25 Gm., but parenteral administration is only an exceptional route.

Complete documentation on request

POULENC - Montreal

modern peptic ulcer therapy *with* **magnesed**

An acid neutralizing, sedative and anti-spasmodic combination for the relief of peptic ulcers, hyperacidity and attendant conditions. (In powder form).

ACTION:— Gastric Acid is reduced by the adsorptive action of Aluminum Hydroxide and by the chemical action of Magnesium Trisilicate. Because neither of these salts produce alkalosis, there is no secondary rise in gastric acidity. Phenobarbital acts as a sedative and Homatropine Hydrobromide overcomes any tendency towards smooth muscle spasm.

One heaping teaspoonful provides:
Magnesium Trisilicate 30 grs.
Aluminum Hydroxide 10 grs.
Phenobarbital 1/8 gr.
Homatropine Hydrobromide 1/48 gr.

*A well tolerated anti-spasmodic free of disagreeable Atropine-like toxic effects.
Dose:— One heaping teaspoonful in half a glass of water every four hours or as prescribed by the physician.

Clinical sample upon request.

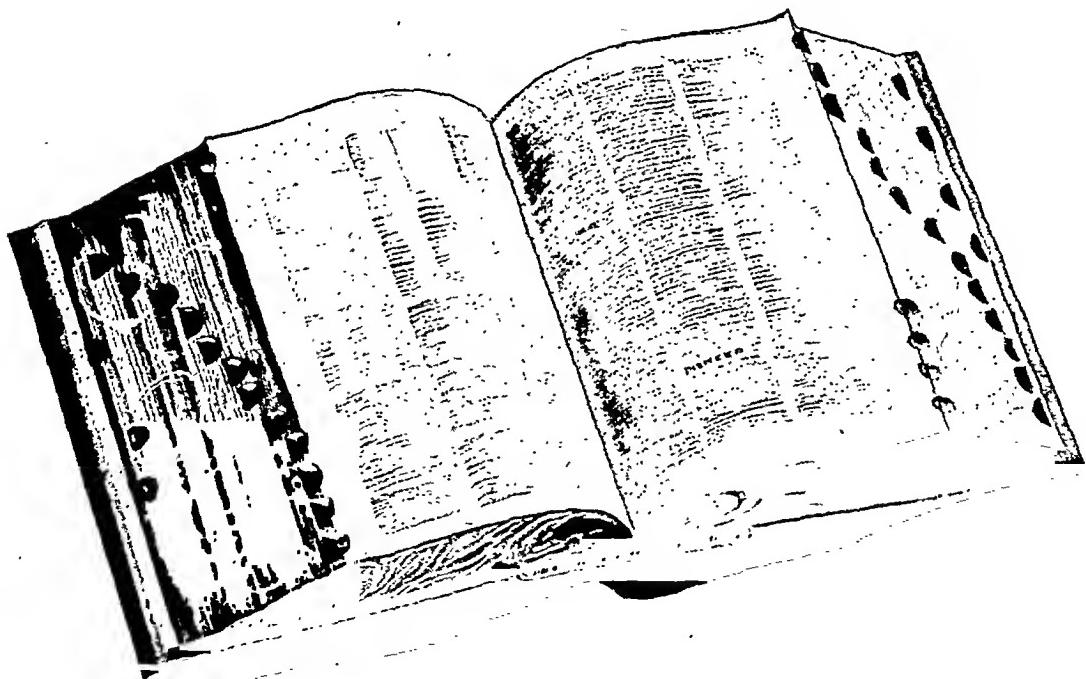


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FINE PHARMACEUTICALS • MONTREAL



WE FIND

A FEW TRUTHS



IN THE DICTIONARY

"**ORIGINAL**" says the dictionary, is "that from which anything is copied; to bring into being, as, he originated the idea".

"**PIONEER**" says the dictionary is, "one who is first in experiments or exploration".

IN AUTHORITATIVE SCIENTIFIC WORKS

DIGITALINE NATIVELLE...THE ORIGINAL PIONEER brand of DIGITOXIN was first isolated by Claude A. Nativelle in the year of Eighteen Hundred and Sixty Eight and to this day as recorded on July 25th Nineteen Hundred and Forty Two in the Annual Phy. of Chemistry of the A.M.A. as the only precise determination of digitalis activity by weight, etc., etc.

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your head cold

PAR-PEN provides the quick, lasting
vasoconstriction of Paredrine and the potent
anti-bacterial action of penicillin. PAR-PEN is one of the
most effective agents you have for clearing up *both* intranasal
congestion *and* infection.

Smith Kline & French Inter-American Corp., Philadelphia • Montreal

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Par-Pen

A NEW HIGH

in maximum hemoglobin production...

with

FERROUS GLYCINATE



freedom from gastric distress

FERROUS GLYCINATE - M.R.T. PROVIDES:

THE ACTIVE RADICAL, GLYCINE, FOUND TO BE ESSENTIAL FOR THE PRODUCTION OF HEMOGLOBIN, and, in addition, APPRECIABLY GREATER QUANTITIES OF AVAILABLE IRON THAN ANY OTHER IRON PREPARATION.

OTHER ADVANTAGES:

Elixir Ferrous Glycinate - M.R.T. is so free from astringency that it will not curdle milk . . . Ideal as an admixture . . . Especially recommended for children.

Capsules Ferrous Glycinate - M.R.T. contain ferrous glycinate suspended in an edible oil, assuring passage through the stomach without irritation and subsequent gastric distress . . . Positive absorption in the intestines.

Send for descriptive folder giving distinguished references
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A NEW APPROACH TO THE TREATMENT OF

TINEA PEDIS
(Athlete's Foot)



E. L. Keeney* has shown the marked lethal effects of sodium propionate on dermatophytic fungi.

Fungol E.B.S. provides sodium propionate in convenient ointment and powder form for combating many types of dermatomycosis. *Epidermophyton interdigitale* (athlete's foot), *Trichophyton barbae* (*tinea sycosis*), *Trichophyton capitatum* (ringworm of the scalp), and numerous other mycotic infections all respond to treatment with Fungol.

The ointment base is water-soluble.

* Bull: Johns Hopkins Hosp. 73:379

AVAILABLE IN
3 CONVENIENT FORMS:

Fungol Ointment in 1 oz. tubes and 4 oz.
and 1 lb. jars.

Fungol Powder in 1 oz. shaker-top tins.

Fungol Solution in 16 oz. and 80 oz.
bottles.

FOR MYCOTIC INFECTIONS OF BODY CAVITIES,
AS IN OTOMYCOSIS, WE RECOMMEND FUNGOI
SOLUTION.

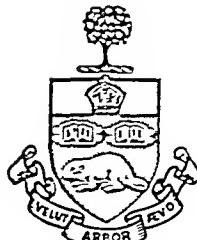
THE E.B.S. HUTTLEWORTH CHEMICAL CO., LTD. TORONTO, CANADA

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Dean of the Faculty of Medicine • • • *University of Toronto, Toronto, Ont.*

J. A. MacFARLANE, O.B.E., B.A., M.B., F.R.C.S.

Dr. MacFarlane was born in Carleton Place, Ontario. He obtained his B.A. degree from the University of Saskatchewan and was awarded a Rhodes Scholarship. Following World War I, in which he served with a field ambulance unit, he completed his medical studies at the University of Toronto. He then did post-graduate work in Oxford, London and Edinburgh, where he qualified for his F.R.C.S. (Edin.) in 1925. Returning to Toronto, and after 18 months as resident surgeon with the late Dr. C. L. Starr, he was appointed to the staff of the Toronto General Hospital and the Department of Surgery, University of Toronto. He continued in the practice and teaching of surgery until the autumn of 1939. Dr. MacFarlane served overseas throughout the last war, attaining the rank of Brigadier in the appointment as Consulting Surgeon to the Canadian Army Overseas. Following his discharge, he became Director of Surgery at Christie St. Hospital and Adviser to the Director General of Treatment Services of the Department of Veterans Affairs, while continuing to teach and practise at the Toronto General Hospital. In 1943 he was made an honorary fellow of the Royal College of Surgeons of London, and in 1945 he was created an Officer of the Order of the British Empire. He was appointed July 1, 1946, as Dean of the Faculty of Medicine at the University of Toronto.



Report to Canadian Physicians from Charles E. Froost & Co.



"ALAMINO"

In all therapeutic methods designed for the treatment of peptic ulcer, one objective recurs like the chorus of a song, namely, the reduction of the amount or neutralization of acid gastric juice. Gastro-enterostomy, subtotal gastrectomy, supradiaphragmatic vagotomy, are among the more heroic measures and are usually reserved for those patients where milder procedures have failed.

These milder procedures are again chiefly directed to eliminating effects of acid gastric juice and include attempts to adjust emotional instability, food habits and the administration of gastric acid neutralizers.

Many such gastric acid neutralizers are in use. All of them have some merit, but none is perfect and continuous investigations have been directed to finding one which would most effectively accomplish the desired end.

The newest preparation is "Alamino" (a compound of aluminum and the amino acid, glycine). This preparation has the advantage over others in that gastric acid is promptly and continuously buffered to a hydrogen ion concentration which protects the ulcer from the destructive effects of gastric juice for as long as the preparation remains in the stomach. This will depend on the emptying time of the stomach under various circumstances and should govern the frequency of administration of "Alamino".

This will vary in different patients and in the same patient under different conditions of emotion and food intake. The frequency, therefore, of the administration of "Alamino",

can be a question of fine judgment and may indeed vary from hourly to three hourly intervals.

Further consideration often has to be given to the relief of pylorospasm and to the quieting of the emotionally unstable patient. For this purpose the combination of "Alamino" with a small dose of atropine and a mild non-cumulative barbiturate, such as "Noctinal" (Sodium ethyl sec.-butyl barbiturate "Froost") has been found especially useful.

References—The neutralization of gastric acidity with basic aluminum aminoacetate, Krantz, Kibler and Bell, Dept. of Pharmacology, School of Med., University of Maryland, Baltimore. Personal communication.



"ALAMINO"

C. T. No. 381 *Froost*

Each tablet contains:

Aluminum glycinate (basic)..... 7.7 gr. (0.5 G.)

"ALAMINO" Compound

C. T. No. 382 *Froost*

Each tablet contains:

Aluminum glycinate (basic).... 7.7 gr. (0.5 G.)

Atropine sulphate..... 1/500 gr. (0.13 mg.)

"Noctinal" (Sodium ethyl sec.-butyl barbiturate "Froost") .. 1/4 gr. (16 mg.)

Dose: One or two tablets, one or two hours after meals and upon retiring.

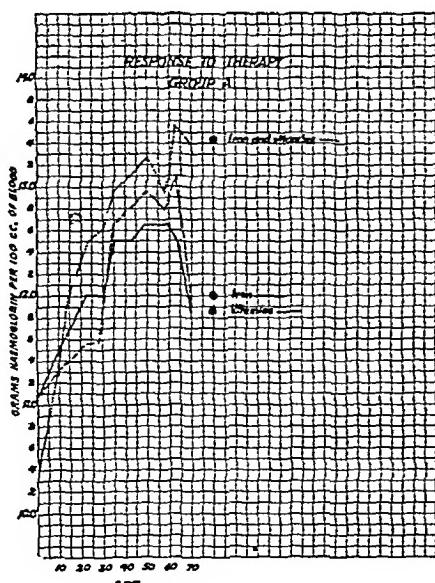
Modes of Issue: Bottles of 50, 100 and 500 tablets.

"PROHEMA"

Hypochromic anaemia is a deficiency disease, and as in most of these the deficiency is of a multiple nature. Although iron may be the most prominent feature of the deficiency state, evidence¹ has now accumulated which indicates that, while the administration of iron alone does tend to improve the anaemia, this improvement is never optimal, and relapses tend to occur, even though iron medication is continued. This fact led to the postulation that anaemias of the hypochromic type were not due to iron deficiency alone, but were associated with other deficiencies most probably of dietary origin.

An investigation was therefore launched in order to clarify the situation. As the investigation proceeded it soon became apparent that groups receiving placebos and vitamins alone showed no sustained improvement. Groups receiving iron alone showed considerable initial improvement, but this improvement was not sustained, whereas groups receiving iron and vitamins, and iron, vitamins and copper, showed the greatest improvement, and this improvement was well sustained. In a number of instances it appeared that those subjects receiving iron, copper and vitamins had some advantage over the others.

The results are best illustrated in the following chart.



In the light of these observations, the formula for "Prohema" was elaborated, and it may be confidently anticipated that many cases of secondary anaemia which were resistant to treatment with iron alone will now respond satisfactorily to "Prohema".

Reference—1) Denstedt, O. F., Department of Biochemistry, McGill University, Private communication.



"PROHEMA" Tablets

S.C.T. No. 432 *©1948*

Each sugar-coated tablet contains:

Ferrous sulphate (exsic.)	0.3 G.
Copper sulphate.....	1.6 mg.
Vitamin A.....	1500 Int. Units
Vitamin D.....	333 Int. Units
Thiamine HCl (Vitamin B ₁).....	1 mg.
Riboflavin (Vitamin B ₂).....	1 mg.
Ascorbic acid (Vitamin C).....	25 mg.
Liver concentrate.....	67 mg.

(Secondary fraction from 3.33 G. of whole liver)

Dose: 1 tablet three times daily.

Modes of Issue: Bottles of 100 and 500 tablets.

"PROHEMA" with Folic Acid

S.C.T. No. 433 *©1948*

Each sugar-coated tablet contains:

Ferrous sulphate (exsic.)	0.3 G.
Copper sulphate.....	1.6 mg.
Vitamin A.....	1500 Int. Units
Vitamin D.....	333 Int. Units
Thiamine HCl (Vitamin B ₁).....	1 mg.
Riboflavin (Vitamin B ₂).....	1 mg.
Ascorbic acid (Vitamin C).....	25 mg.
Liver concentrate.....	67 mg.

(Secondary fraction from 3.33 G. of whole liver)

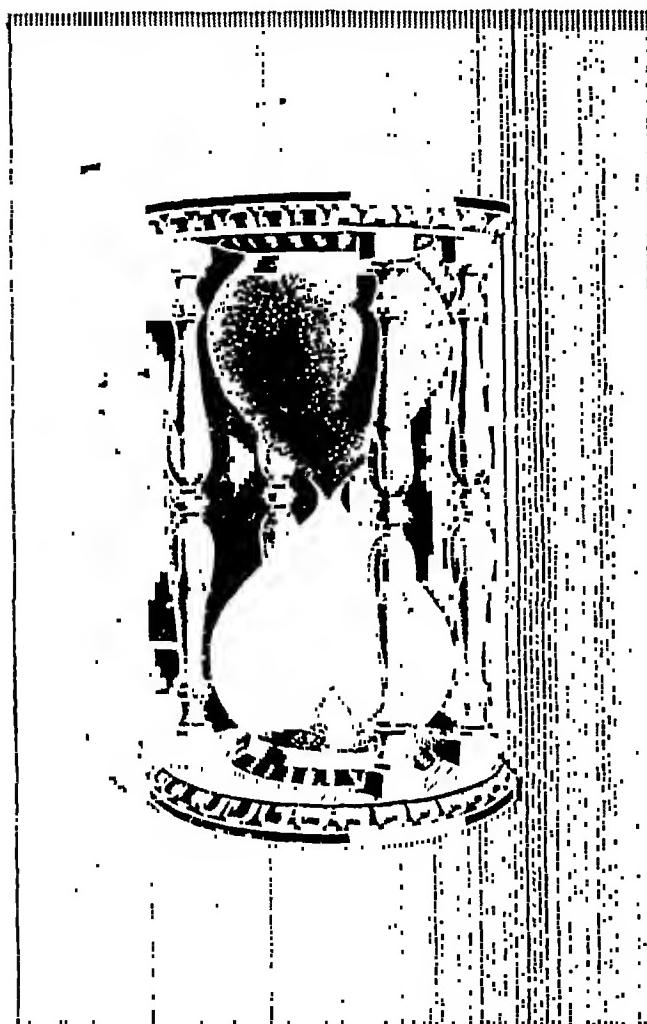
Folic acid..... 1.67 mg.

Dose: 1 tablet three times daily.

Modes of Issue: Bottles of 100 and 500 tablets.

Charles E. Froest & Co.
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Prolonged effect in local mouth lesions



Bristol Crystalline Penicillin G Troches, plain and with benzocaine, are white in color, pleasantly flavored with peppermint. The benzocaine form will be found especially useful in the presence of painful, inflammatory mouth lesions. The formula includes 5 mg. of benzocaine per troche, which provides adequate local anesthetic effect with minimum numbing discomfort.

Bristol Crystalline Penicillin G Troches are indicated in the prophylaxis and treatment of *Vincent's infection*.

BRISTOL CRYSTALLINE PENICILLIN G TROCHES are available in bottles of twenty, each troche containing 5000 units of Crystalline Sodium Penicillin G.

BRISTOL CRYSTALLINE PENICILLIN G TROCHES with Benzocaine are packaged in bottles of twenty, each troche containing 5000 units of Crystalline Sodium Penicillin G plus 5 mg. of benzocaine.



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To many women over 40, proper oestrogenic therapy
can bring not only physical relief from the wearing
effects of the menopause but, more important still:
a new outlook on life.

It is not enough, however, that this minor miracle be accomplished temporarily.
Its effects must be sustained and that without the annoyance
and expense of too frequent injections.

*
Because DI-OVOCYLIN meets these requirements so fully it has become
the oestrogen of choice among a large and ever increasing section of the
Canadian medical profession. Through its use the organism is spared
the periodic alternation of hormonal want or abundance
and is supplied a constant, sufficient amount of oestrogen. A single injection
of DI-OVOCYLIN every 14 to 21 days will control symptoms in the majority
of menopausal patients. Finally, being a derivative of natural oestrogenic
hormone, it has the added advantage of producing a feeling
of well-being in the patient.

Available at all pharmacies in 1 cc. ampoules and multiple dose vials of 10 cc.



* Ciba's brand of α -oestradiol dipropionate

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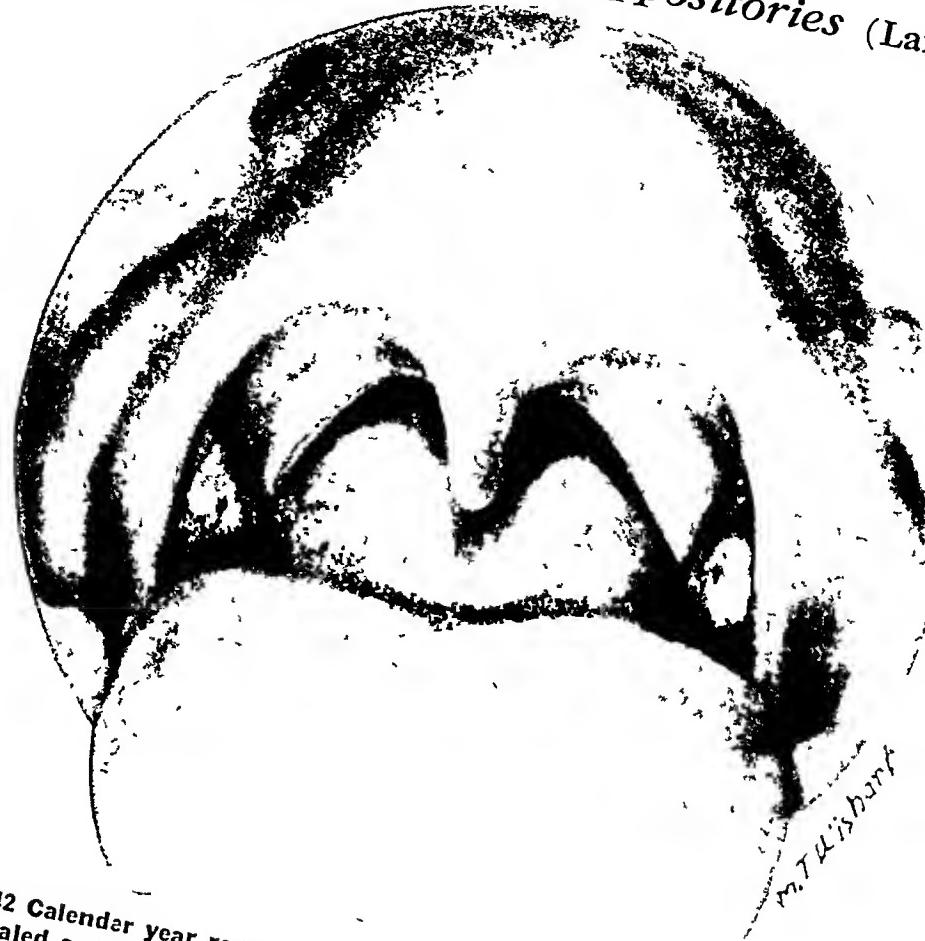
- No. 106 — Androgens and Estrogens in the Treatment of the Menopausal Syndrome.
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Canad M A J
Oct. 1948, Vol 59

187,589 Sick Days Lost!

NEO-LARYNGOBIS Suppositories (Lafayette)



M.T. Kishurt

The 1942 Calendar year report for the U.S. Navy on acute throat infections revealed a ratio of 35.67 per 1000 with 187,589 sick days for the year

Acute Tonsillitis was responsible for 110,902 sick days for all cases treated. In extensive clinical investigations it has been found that 'Bismuth Salts are efficacious in treatment of acute throat infections'. In cases of Follicular Tonsillitis the symptomatic relief is much more rapid with Bismuth (6-8 hours) than when Penicillin is used (24 - 36 hours). Hospitalization is one (1) day less than when Penicillin is used. Administration by rectal suppositories solves the difficulty up to now common to both Penicillin and Bismuth treatments; that is, inconvenience and costliness of intramuscular injections. Rectal Bismuth therapy in Throat infections is simple and inexpensive, quick and efficacious.

Reference: Dr. Boris Schuster, Commander (MC) of the U S Navy, "Therapy of Throat Infections with Bismuth vs Penicillin", U S Naval Medical Bulletin, vol 48, #1 61-65 January, February 1948
Silber S "Treatment of Tonsillitis", Journal of Pediatrics, July 1948, vol 29, p 59
Storin J S "Treatment of Acute Tonsillitis by rectal administration of the New Bismuth Compound", Archives of Otolaryngology March 1944, vol 39, p 259
Silber, S "Bismuth Suppositories in Throat Infections", Journal of Pediatrics, September 1944, vol 25, p 244
Storin J S "Preoperative and Post-Operative care in Tonsilleotomy", The Eye, Ear Nose and Throat Monthly, May 1946, vol 24, p 239 - 240

LITERATURE ON REQUEST



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"one nervous woman
... can give rise
to more diverse, undiagnosed
and undiagnosable complaints
than a whole pathological ward."

Harding, T.S.: M. Rec. 160:198 (April) 1947.

For the many patients,
especially women, who
complain of nervous
tension throughout the day
and wakefulness during the
night, ESKAPHEN B ELIXIR
is an ideal preparation.

Eskaphen B Elixir

provides—in delightfully
palatable liquid form—
both the calming action of
phenobarbital and the
tone-restoring effect
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For the nervous patient with poor appetite

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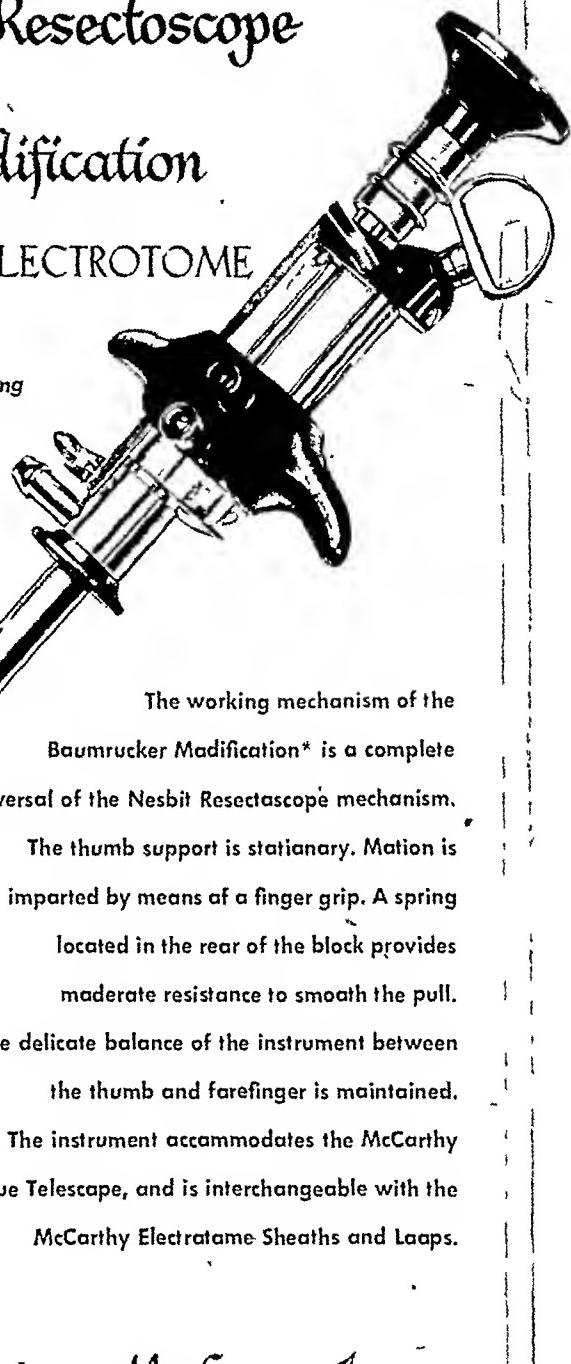
Baumrucker Resectoscope

REVISION
OF THE

Nesbit Modification

OF THE STERN-McCARTHY ELECTROTOME

In this instrument motivating power for pulling
the loop through prostatic tissue is supplied
by the forefinger rather than the thumb.



The working mechanism of the
Baumrucker Modification* is a complete
reversal of the Nesbit Resectoscope mechanism.

The thumb support is stationary. Motion is
imparted by means of a finger grip. A spring
located in the rear of the block provides
moderate resistance to smooth the pull.

The delicate balance of the instrument between
the thumb and forefinger is maintained.

The instrument accommodates the McCarthy
Farabique Telescopc, and is interchangeable with the
McCarthy Electrotome Sheaths and Loops.

*The Journal of Urology, Vol 55, No 5, May 1946

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HEMO-PAK Hemostatic Absorbable Surgical Dressings consist of oxidized gauze or cotton in the form of sterile packing strips or cotton pads.

Just remove from the sterile, sealed tube or jar . . . place in contact with the bleeding surface—with slight pressure. Within two minutes—like magic—the material turns black in contact with hemoglobin, forming an artificial clot to effectively dam bleeding vessels.

Hemo-Pak can be buried in most tissues with safety since—in a few days' time—absorption is complete, with no ill effects or local irritation.

Hemo-Pak (Brand of Oxidized Cellulose) is a complete hemostatic unit, and, requiring no cumbersome manipulation, provides a prompt, effective and practicable means of controlling hemorrhage even under the most inconvenient and difficult circumstances.

HEMO-PAK, in two types and three sizes:

Hemostatic Absorbable Gauze Packing Strips:

- (1) 2" x 14" for hemostasis in general surgery and where suturing or ligation is impractical or ineffective.
- (2) ½" x 2½ yds. for postnasal packing following otolaryngologic procedures, and control of spontaneous hemorrhage.

Hemostatic Absorbable Cotton Pads:

- (3) 6" x 2" for hemostasis in brain surgery. Each pad in sterile, sealed tube or vial, packed 12 tubes to a box.

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DRESSINGS



Good Health... VITAMINS *Lederle*

The trend in medicine today is to regard nutrition as a continuous and essential contributor to good health. The clinician strives to maintain nutrition not only for the purpose of preserving good health, but also to accelerate a return to that state by encouraging tissue repair and normal physiology.

Multivitamin therapy has proven to be a tested method of promoting vitamin nutritional balance and preventing avitaminosis. For these purposes physicians have found the following preparations distinctly useful.

For Therapeutic Use:

PERFOLIN* Multivitamins *Lederle*
Bottles of 30 and 100 capsules

For Supplementation:

VI-MAGNA* Multivitamins *Lederle*
Capsules: Bottles of 100, 250 and 1,000.
CLIPSULES*: Bottles of 100
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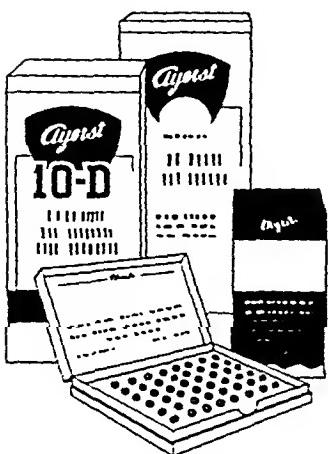


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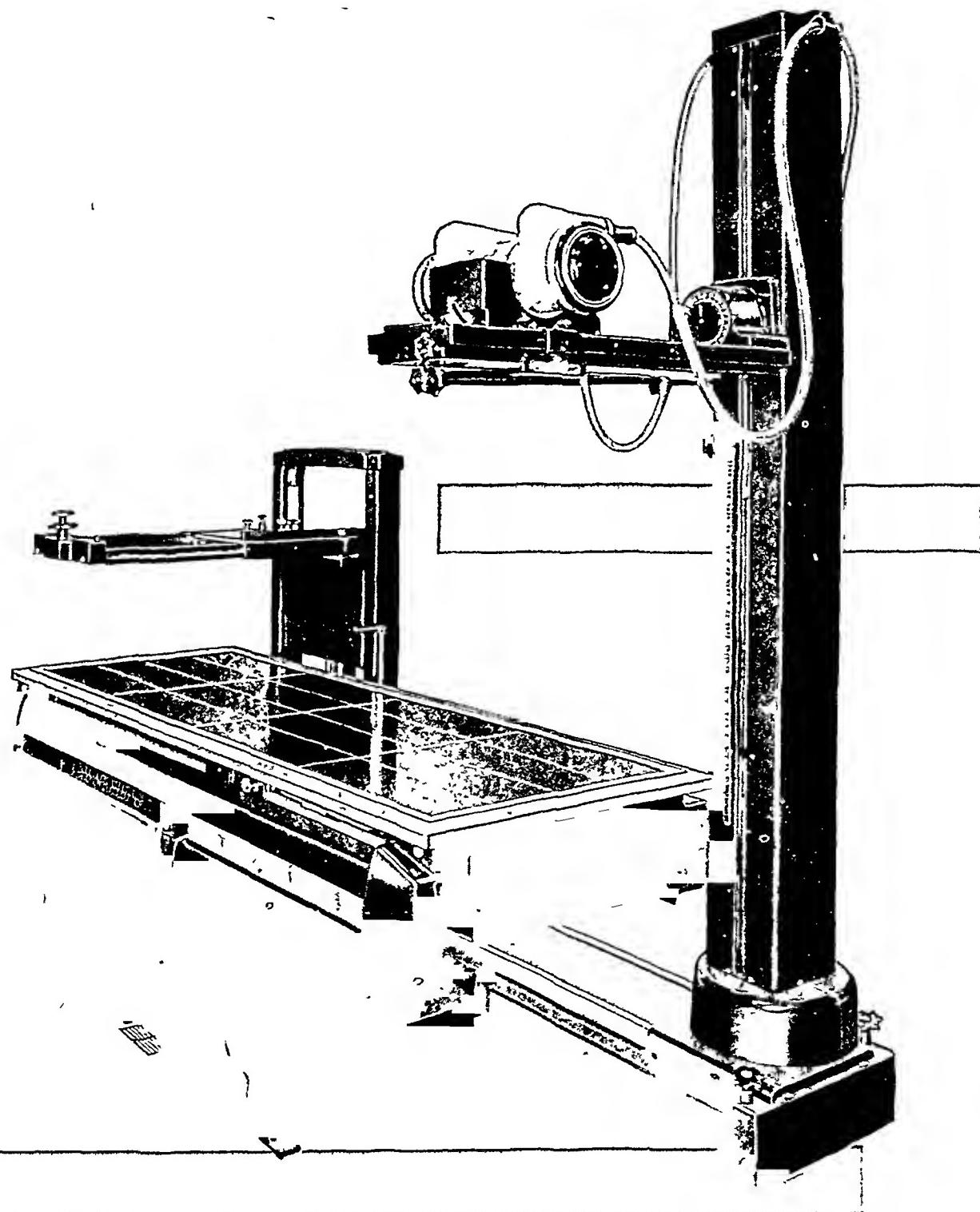
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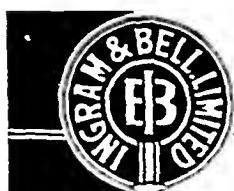
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ANXIETY STATES*

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Montreal, Que.

CLINICAL conditions which are essentially anxiety states, and conditions in which anxiety, while not the primary factor, plays a significant part, constitute an outstandingly large part of medical practice. Our knowledge of the anxiety states has been considerably enlarged in recent years by the introduction of a number of new concepts, certain of which will be discussed.

Autonomous states.—It is now recognized that a certain number of the anxiety states may become self-perpetuating (Cameron, 1944). Once an individual has been rendered anxious over a prolonged period, he tends to become over-reactive to situations likely to produce anxiety. Hence, even when the major primary stress which was responsible for his original anxiety has been removed, the minor stresses and tension-producing situations of day-to-day living, by repeatedly eliciting the anxiety response, are sufficient to maintain his over-reactivity and, therefore, his anxiety state. A concrete illustration is afforded by the individual who has been exposed to excessive and prolonged anxiety, either in combat or in the form of financial or job insecurity.

The recognition of these states has been delayed largely because, in medicine, we tend to take over the rather simple nineteenth century physics concept of causation: Cause A produces Effect B; when you stop A, you stop B. Or, still more literally, you put the poker in the fire and it gets hot; you take it out and it cools down to its original temperature.

When this simple, straight line idea of causality is applied to the anxiety state, it expresses itself like this: put sufficiently severe stress upon an individual and he will become anxious; remove the stress and his anxiety will disappear.

But the fact is that in a proportion of cases this does not happen, the patient continuing to remain anxious and fearful about many things long after the original stress has gone. From this there has arisen a series of unfortunate consequences. The first is that his relatives, neighbours, and too often his physician, have said: "Everything is all right now. You have nothing to complain about", thereby simply increasing the burden which he has to carry. A second consequence is their assertion that since everything is all right—since the dangerous war service is over, since his financial worries are at an end—the real cause of his complaints must be something that earlier medical examinations had overlooked: an impacted wisdom tooth, a histamine sensitivity, his sinuses, his stomach, bowels or haemorrhoid tag. There then ensues that unhappy pilgrimage through the offices of the internist and the surgeon, the orthopaedist and the urologist.

There are some aspects of the behaviour of living organisms which follow the system of straight line causality, but for the most part behavioral trends follow other more complex types of causality, of which autonomy is one. Here event A produces event B, which produces C, the latter producing D and D finally producing A. In other words, you have a circular rather than a straight line system of causality.

Our methods of breaking up such autonomous systems are still quite elementary. They are based either upon the principle of damping down the reaction, by chemical sedatives such as the barbiturates or physiological sedatives such as insulin, in the anticipation that if it does not occur over a period, the tendency will disappear, or upon the principle of breaking up the system, the only example of this being the drastic procedures of lobotomy.

Closely related to this concept of the autonomous anxiety state is that of the subliminal tensional rise. There is growing appreciation of the fact that the level of tension fluctuates

* Read at the Seventy-ninth Annual Meeting of the Canadian Medical Association, Section of Psychiatry, Toronto, June 24, 1948.

in the individual from minute to minute, depending upon the demands which the environment make upon him. By far the larger number of such fluctuations are subliminal—we do not become conscious of them. But in the anxiety neurotic, whose tensional level is persistently high, even such small increments may suffice to produce symptoms. Hence the probable explanation of the sudden appearance of symptoms which because of their apparent causelessness are specially disturbing to the patient, who, being unable to discover what evokes them, cannot take steps to prevent them.

In actuality, one may presume that he has been reacting to an incident, such as walking in a crowded street, meeting a stranger, sitting in a movie or occupying a seat in a bus facing a number of other passengers. All such incidents tend to cause subliminal tensional rises in the normal individual; in the anxiety neurotic, such rise may constitute a sufficient increment to evoke his anxiety pattern.

Differentiation of anxiety.—This is a second concept of major significance in the development of our knowledge of anxiety. It is generally agreed that the anxiety response is total, i.e., that the whole organism responds. It is not so clearly recognized that the manifestations of tension and anxiety tend to vary in their intensity from one part of the organism to another, and that the pattern which this variation takes, while tending to remain constant for the individual, differs considerably from person to person (Cameron, 1944). Failure to recognize this differentiation of patterns continues to lead to a most considerable number of faulty diagnoses. The explanation of by far the greater number of these errors is the same, namely, that the diagnostician has concentrated his attention upon the patient's complaint, to the exclusion of the patient. Hence we still find an extraordinary number of hypertensive, gastric ulcer or headache patients treated with little or no attention to any other part of the patient lying outside the area of complaint. In passing, one may comment that this trend increases with specialization. The oldtime family doctor was too versed in human nature to fall into some of our modern errors of exclusion.

Certain further comments should be made upon this concept of the differentiation of

anxiety. As a working tool, we now rely on the premise that if an individual is repeatedly exposed to long and severe anxiety, that area in which the anxiety expresses itself predominantly may become progressively disorganized with each repeated period of anxiety. Hence we see that the man who from earliest childhood has tended to react to stress by anorexia, flatulence and perhaps vomiting, tends to pass over gradually to ulcer formation and eventually to reach a point where medical and surgical measures have to be brought in to supplement psychiatric therapy.

We are inclined to think that the same is true of certain cases of arterial hypertension and perhaps of hyperthyroidism. In regard to the latter, it may be stated that a certain percentage of anxious people tend to show increased activity of the thyroid gland during stress, and that when the stress is removed, the elevated basal metabolic rate and other signs of hyperthyroidism disappear, to return, often with increased intensity, with subsequent exposure to stress, until a chronic hyperthyroidism results. If, instead of removing the stress, we remove the thyroid itself, the results can only be designated as most unfortunate.

When we ask the obvious question why one man reacts to stress by losing his appetite and another by developing feelings of pressure around his chest, we are entering a region where there are more unexplored than known areas. In a certain number of cases, the pattern is due to the significance which it has for the individual. The child brought up in the home in which excessive attention is paid to eating—"You must eat the right amount at the right time", or conversely, "If you don't do this, you won't be allowed to eat your supper"—is apt to use his eating function as a means of asserting himself, and from this it is only a step to the establishment of gastro-intestinal symptoms as a reaction to stress. Similarly, the child brought up in a home in which the father suffers from a cardiac condition will soon attach excessive significance to precordial twinges and pressures.

There remains, however, a large number of cases which cannot be explained upon this basis. Current attempts to relate the differentiation of anxiety patterns to personality characteristics—traits of repressed hostility being related to gastric ulcer—seem without adequate foundation.

We have referred to the fact that the pattern of tension and anxiety varies from individual to individual. Reference must also be made to the fact that though these patterns are relatively fixed, some degree of variation within a given person does occur. One of the major factors in bringing this about is the immediate need of the individual. Jacobson (1928) in a series of valuable investigations has shown that when an individual undertakes a task in which he has acquired skill, tension tends to fall in those parts of the organism which are not involved, remaining at a high level in those parts which he requires for the performance of his work. A simple illustration is afforded by the typist in whom tension remains high in the arms, shoulders and neck but falls in the lower extremities. Observations which are of direct clinical significance are that when the individual is pushed to perform at a greater speed than is customary, this differentiation gradually breaks down and there ensues a general tensional rise, which increases to the point where he is pushed completely beyond his capacity and becomes so disorganized that he gives up. In this connection it may be stated that the tensional anxiety neurotic shows a considerably reduced capacity to differentiate tension during work, and hence his level is likely to remain uniformly high.

Residual tension.—This is a concept which has been well known to the experimental psychiatrist and psychologist for at least two decades, but is one which we have hardly begun to apply clinically. Tension can be observed and measured in a variety of ways—the blood pressure, heart rate, gastric activity, and changes in the electrical potentials of skeletal musculature. The latter is one of the most convenient. It has been shown by Sharp (1941) that when work has been undertaken, the tension in the muscles involved does not subside immediately, or in an even manner. After a period of two minutes' work with a dynamometer, the tension in the arm muscles of his subjects did not return to resting level for about thirty minutes, and during that time of resting showed notable increases and decreases. Clinically, we are aware that the capacity to relax varies considerably from one individual to another. We are also aware that many modern industrial occupations are extremely tension-producing, and we are increasingly inclined to suspect that those individuals who show diffi-

culty in getting rid of tension should not be allowed to enter certain types of occupation, as for instance the highspeed, repetitious jobs.

When this concept of residual tension is linked to that of the differentiation of tension, certain possibilities of great interest present themselves. Clinically, we have seen a number of patients in whom certain areas appear to remain chronically over-reactive and which serve, as it were, as "trigger" zones which, once stimulated, set off a generalized tensional anxiety response. We have conjectured that either the tensional level remains high in such cases, or that there are areas, specially reactive to stress, which rapidly develop high tensional levels, which then spread to produce a general tensional anxiety state.

In some individuals, these areas exist in the skeletal musculature or in parts of it. We have learned to distinguish two large areas which appear to be particularly over-reactive. The first is located in the head and neck and consists in a special liability to develop aching of the neck, head pressure complaints, difficulty in swallowing, constriction of the throat, circumoral tremor, voice tremor and stuttering. The second is located in the lower extremities and shows itself in the form of increased deep reflexes, clonus, jerking of the legs in going to sleep, Rombergism, and feelings that the surroundings are swaying. In other individuals, we suspect that areas of the smooth musculature, such as the urinary bladder, may constitute trigger areas.

Experimentally, we have been able to show (Cameron, 1947) that once an area, such as the cardiovascular system, has been rendered over-reactive by means of large doses of adrenalin, it remains so for several days, and if stimulated again during that period not only shows itself to be much more reactive than before but also serves to elicit a generalized tensional anxiety state.

Thus far, the working premises which have been stated are those which seem designed greatly to expand our knowledge of and our control over these widespread and crippling states of anxiety. At this point, I should like to urge in the strongest possible terms the destruction and removal from our thinking of a concept which has a great share of the responsibility for our failure adequately to recognize, and hence to deal competently with,

these states. This is the concept of the imaginary complaint.

As you know, if a patient complains about a certain area, and if careful examination of that area reveals no deviation from the normal, it is customary, sooner or later, depending upon the conscientiousness of the physician's examination, to dismiss the complaint as imaginary. It is difficult strictly to define what he means by imaginary, perhaps because at this point he has given up being a scientist and is now a moralist. Among other things he means that the patient should not be complaining and that he could help it if he wanted to.

Now this serves simply to indicate our deep confusion concerning psychological states: for if there is a complaint, that is as definite a phenomenon as a mass in the breast or a bulging saphenous vein. As we know, it can be at least as crippling, and it most certainly deserves a scientific explanation.

There, such rise may patient may complain
crem' reasons why a p^{ie}...
about an area in which no deviation can be found are numerous. He may complain because the area has a special significance for him, as in the case of a woman who had a great desire to talk about certain matters concerning which she felt guilty and an equally great fear that she might get into trouble if she did so. Her complaint was of tightness of the jaws. Or a patient may complain because he feels anxious and socially insecure and needs to know that he is the object of regard. Or again, he may complain because of the need for expressing deep hostility.

And finally we may say that all tensional anxiety states are total responses, and hence there is a great range of happenings throughout the body which may result in symptoms appearing, the physiological correlates of which we have not yet recognized. One may point to the fact that the aching in the back of the neck, so common in these conditions and so often dismissed as imaginary, almost always is accompanied by increased tonus in the musculature of that area, a fact which can be recorded by means of the electromyogram to the satisfaction of the most concrete-minded of men.

One may also point to the fact that a general hyperesthesia is a common accompaniment of tensional anxiety states, and that we can point to a lowering of the sensory threshold as an

explanation of certain of the more unusual complaints of throbbing in the abdomen, photophobia and complaints concerning visual disturbances and skin sensations.

Throughout this discussion of tensional anxiety states there is implicit the concept that anxiety is the response of the individual to stress and primarily to environmental stress. But since, as indicated earlier, the organism reacts as a whole, peripheral participation in the form of muscular tension or over-reactivity of other organs tends to facilitate central responsiveness, hence setting up a reciprocally reinforcing system. If this can be interrupted at any point, the action breaks down. Hence the value of such diverse agents as psychotherapy, chemical and physiological sedations, and lobotomy.

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RÉSUMÉ

L'importance de l'angoisse, dans les états où elle est un facteur primaire, mais aussi là où elle vient s'ajouter, en les compliquant, à d'autres états, tient à ce qu'elle tend à se perpétuer. Au contraire des phénomènes de la physique, elle ne disparaît pas avec une cause simple; l'état anxieux reconnaît plusieurs s'influencent réciprocement et formant cercle. Les moyens d'attaque de ce cercle vont de l'usage des sédatifs à la lobotomie pré-frontale, la psychothérapie occupant une place intermédiaire mais non la moins importante. Les manifestations cliniques de l'angoisse se différencient à l'extrême d'un malade à l'autre; elles sont la pierre d'accroissement de ceux qui entendent traiter le symptôme en oubliant de soigner le patient. Dans ces état de choses, celui-ci subit des thérapeutiques dont ses maux ne sont pas justifiables, et le répit accordé l'angoisse causale donne libre cours à la désorganisation de plus en plus complète du secteur, somatique ou psychique, dans lequel l'angoisse s'était manifestée d'abord. Ce désordre principal s'ajoute à un substratum de tension généralisée dite "résiduelle", qui se traduit dans les musculatures striée et lisse, et rend le malade sensible à des incitations qui seraient subliminales pour le sujet normal. L'hypertonie des masses lombaires, chez l'anxieux qui a mal au dos, atteste bien de la réalité concrète d'un symptôme qui, pour être purement fonctionnel, ne mérite pas d'être appelé imaginaire.

PAUL DE BELLEFEUILLE

CONCRETE BLOCKS SUGGESTED IN PLACE OF METAL HOSPITAL BEDS.—Concrete blocks in place of metal beds in hospitals of the future are recommended by a French architect, Jean Walter, a French hospital designer, explains his novel concrete bed in a report on hospital building in the British journal, *The Lancet*. Patients would sleep on the usual mattress and springs. Instead of the metal frame support, the bed would be a hollow concrete block covered with earthenware. "This would save considerable trouble in cleaning," M. Walter points out. Each block would have drawers for the patient's property and medical equipment, and the concrete bed could be wired for diagnostic instruments.

THE SCIENTIFIC OUTLOOK*

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THOSE of us who can look back upon fifty years in our profession have been privileged to witness greater advances and greater changes in outlook than has occurred in any other half century.

When first I joined the profession as a medical student in 1897, surgery was entering upon its boom period. Prior to 1847 surgery must have been a grim procedure. Used only as a last resort, it called for great manual dexterity and self-confidence to complete an operation in the minimum of time, while to operate upon a shrinking and probably a shrieking patient, required an iron nerve not rendered too susceptible by unnecessary sympathy or imagination. Even when anaesthesia had removed the pain of the actual operation, there remained the grim prospect of hospital fever, until Lister's great discoveries in the 1860's made it possible to minimize, if not completely to remove this.

Lister's work was, I think, the first great medical advance founded upon the discoveries of a worker in another branch of science. Other men before Lister were as near as he to a clinical understanding of the problem, but he was fortunate in following Pasteur, who gave him the key which he employed so skilfully to elucidate not only this surgical problem, but to establish a basis for the study of many other conditions. When I entered the medical school in 1897, Lister's antiseptic methods were accepted the world over. A new race of surgeons had been bred into the profession with other requisites than mere speed and self-confidence. The work of these men was founded upon a science, bacteriology, and although this was a very small branch in those days it turned the surgeons' minds into scientific channels.

Bacteriology, upon which antiseptic surgery was based, was at this time in its infancy, and was included in the teaching of general pathology. I think I am right in saying that at that

time we recognized only one streptococcus and two staphylococci and about a dozen other organisms. I remember well the pride with which our professor of pathology exhibited to us the first specimen of the plague bacillus, which he had obtained from a sailor at the new Manchester dock. Now bacteriology is a science in itself, with numerous branches. Not only do we know of large numbers of organisms undreamed-of when I was a student, but other distant relatives, the viruses, etc., while general principles of antibodies, immunity, etc., have gradually been worked out.

It was about this time that Roentgen discovered his magic rays which made it possible for the surgeon to see the bones whose positions, up to now, he could recognize only by palpation. The first x-ray apparatus in my teaching hospital was established only in my late student days and when I was a house surgeon the x-ray examination of fractures was by no means routine, and we were taught still to rely upon our clinical senses. It was not long before the clinician and the scientist combined to discover opaque substances which made the study of the alimentary canal possible, while at a much later period substances were discovered which would be excreted to make visible changes in kidneys, gall bladders, etc., or could be injected into Fallopian tubes and internal spaces.

In my student days the rising generation of surgeons had grasped the inter-relation of science with surgery, and the necessity for the young surgeon to be well trained in the sciences, and for the older ones to keep abreast of scientific advances. Without a sound basic knowledge of chemistry, physics, biology, bacteriology, pathology and above all of physiology, no surgeon could hope to take a part in the thrilling exposure of nature's secrets, on which the surgeon and his allies were at that time engaged. I remember seeing the first cystoscope used in Manchester, though I am afraid none of us, not even the surgeon, at that first attempt saw anything but a bright red field: this again was the combined effort of the surgeon and the scientist.

Surgery, at that time, was beginning to blossom. Month by month, almost day by day, new organs and new pathological conditions were found amenable to the knife, but only those surgeons who were abreast of the developments in physiology and the basic sciences could plan advances in surgery. In other words, a surgeon

* Read at the Seventy-ninth Annual Meeting of the Canadian Medical Association, in General Session, Toronto, June 25, 1948.

now had a scientific outlook, not merely that of a craftsman.

In the early years of this century, when I was a hospital resident, aseptic replaced antiseptic surgery. This new development came from the United States, and reached us in the first decade of this century. In 1903-04 when I was a house surgeon at the Manchester Royal Infirmary, we used sterile gowns, the first autoclave sterilizer having been installed when I was a student, but we had no gloves nor masks nor caps, and we still used strong antiseptic lotions for our instruments and hands and for the patients' skin. A year later, when I had transferred to Saint Mary's Hospital for Women, asepsis came in with a rush, and about the same time came the Trendelenburg position, which simplified access to the pelvic organs. Asepsis was a great advance, as organs could now be handled more delicately and without irritation, and it was this which made possible the future great extension of surgery. In those days there was much discussion about sepsis and its avoidance, and even more on the treatment of cases we had infected. Today it is taken for granted that a clean case will remain clean.

When we speak of the limitation of the old-time surgeons however, we must bear in mind the development of theatre equipment which today we take for granted. Metal tables capable of many movements: special lighting: autoclaves for dressings and instruments: dressing rooms for surgeons, most of these the combined invention of the surgeon and the scientist.

When first I went to Saint Mary's Hospital, the last few weeks of the old hospital, the operating theatre was a small room with a wash hand basin in one corner, a gas ring in another over which the Sister boiled her instruments, a solid wooden table incapable of any movement, and no artificial light. I remember on one occasion a sudden thunder-storm blotted out the light in the middle of a vaginal hysterectomy, but the surgeon, unperturbed, continued by the light of a bicycle lamp, a reading lamp and a candle lamp which three students held.

Since that time surgery has developed out of all recognition, and is now divided into as many special branches as before there were operations, and calling to its aid many discoveries undreamt of 50 years ago, transfusions, chemo-therapeutic agents, radium,

x-rays and many other wonderful inventions all based upon science.

In the early days of this century, when surgical development was in full tide, almost all ambitious students wished to become surgeons or specialists in a branch in which surgery was used, gynaecology, ear, nose and throat, ophthalmology etc.: a number of able men, repelled by the long and irregular hours of the clinician or attracted to pure scientific research, entered one of the many scientific branches, physiology, pathology, bacteriology, biochemistry, etc., though in my early days many of the chairs in anatomy, physiology and pathology were filled by disappointed men: anatomy by surgeons, physiology and pathology by physicians who had been overlooked in the fierce competition for clinical appointments in teaching hospitals. Before the sudden development of surgery through its partnership with science, medicine had attracted the best brains, and medical knowledge, in its clinical aspect, developed in the 18th and early 19th century more rapidly than did surgery. In the early part of this century however, pure medicine was rather in the doldrums. As students we disliked the idea of spending an hour to examine a patient and to make a diagnosis, only to be told that the only treatment was Mist, Arsenicalis or some placebo, whereas, so it seemed to us, the surgeon would, in the same time, have removed the offending organ. Later in the century medicine was to make a handsome recovery when it too wedded science. Take only two conditions which, in the early part of the century were always fatal: diabetes, the cure of which was discovered in this city, and pernicious anaemia, now cured by liver extracts. I am not sure, but I always think that medicine recovered its position after the first world war, which was fought for over four years in the worst possible conditions without any serious outbreak of typhoid fever, whereas in the South African War, only fifteen years earlier, our men had died like flies from this scourge.

These developments in medicine, like those in surgery, have come about by the co-operation of the clinician and the scientist, and nowadays the physician must have a scientific training and a scientific outlook.

In my own branch, obstetrics and gynaecology, the story runs parallel with that of surgery, as they both base their modern de-

velopment upon Listerism. As so much of British obstetrics was domiciliary it took a much longer period for antiseptic principles to permeate the whole practice, but it gradually did so and this, with the recognition of oral infection and the more recent discovery of chemo-therapeutic agents is the main factor in the reduction of maternal mortality from 5 per thousand as it was at the end of the first Great War, to 1.2 per thousand as it stands today.

In Great Britain gynaecology was developed chiefly by the obstetrician, although a few pioneers are best described as general surgeons with a leaning to gynaecology. These obstetricians adopted the antiseptic and later the aseptic technique as did the general surgeon and it was really the gynaecologist who showed that the abdomen could be opened with safety. In the last fifty years the changes in gynaecological practice have been enormous, as the gynaecologist, like the general surgeon made use of the discoveries of the scientist.

Probably the greatest field of scientific research in my department has been the discovery of the hormones. When I was a student we knew much about the thyroid and a little of the suprarenals, and we knew vaguely that sex characteristics depended upon the sex glands. Now we are flooded with information about these organs and the various hormones produced and the symptoms which are produced by too much or too little of some particular extract.

Clinically we are still groping in the dark. It may satisfy the scientist to know that the increase or decrease of a certain substance will produce certain symptoms. Unfortunately, these same symptoms may be due to the increase or decrease of certain other substances, and we clinicians are sometimes puzzled to know whether in certain cases to give more of one hormone or less of another. We may be sure, however, that before long this tangle will be straightened out by the combined effort of clinician and scientist.

I think all will agree that the clinician and the scientist combined have developed our profession in a way impossible to either alone, and that the medical student must be given a sound foundation in the basic sciences while the practitioner, whether he be physician, surgeon, obstetrician, specialist or general practitioner, must maintain a scientific outlook.

While maintaining a scientific outlook we must, however, be careful not to forget our main

calling, to cure the sick and to give aid to the suffering. We must not allow our scientific outlook entirely to eliminate the humanitarian or to teach our students that patients are so many rabbits for experimental purposes or labelled with certain diseases calling for stereotyped treatment. Each patient is an individual reacting differently, in minor degrees, to the same disorder, and in a large degree to the same treatment and that each is a study in himself.

In England we had before this second Great War very few whole time chairs in clinical subjects. During the war an interdepartmental committee known as the Goodenough Committee was set up to study medical education. On this subject of whole time chairs they heard much evidence for and against, and wisely reported that the system should be tried in a few universities. In Great Britain by whole time chairs we mean that the professor devotes his whole time to what you call ward patients and is debarred from attending private or semi-private patients. I imagine the individual members of the Committee had in mind well trained and experienced clinicians with a scientific outlook and with problems to elucidate which the strain of private practice prevented them from working upon. There are a number of these men, but few of them can afford in the full tide of private practice, and with the commitments they have undertaken, to abandon these for the salaries which the universities offer. A salary adequate for a man who has deliberately chosen in youth the more leisurely and more certain path of academic teaching and research, cannot attract the man who is in the full tide of success after the long hard years of fierce competition which the academic teacher does not experience. There are a few instances where first-class experienced clinicians have made this sacrifice, but they can only be few, the field with the present small salaries being generally restricted to the young, partly trained and completely untried, or older men who have not made a success of clinical work.

The universities, however, are in full cry after the words "research" and "academic outlook". To many of them research begins and ends in a laboratory, while academic outlook often means little more than a spirit of contemplation which requires double the time to do any piece of clinical work. They overlook the fact that clinical observations are as

much research as are those in the laboratory, and that the best is one who correlates the two. Laboratory technique can be acquired in a comparatively short time and competent technicians command comparatively low salaries: the well trained clinician is the product of many years of careful training, and is under a strain which University men do not understand. If the clinician has had laboratory training, as so many clinicians now have, it is an asset, but all that is essential is sufficient scientific knowledge to direct his laboratory technicians and to correlate their findings with his clinical observations.

More dangerous, because more subtle, is the encouragement given in Great Britain to men to train for University posts through whole time appointments without contact with patients in private practice, and without the stimulus of competition with their rivals. However desirable it may be for an older man to have leisure to digest the accumulated facts of a busy clinical period and to correlate them to scientific research, a young man with limited hours of duty, un hurried time for contemplation and clinical experience limited to one social class in an institution, may develop little more than a habit of contemplation.

The Universities overlook the fact that in England our pioneer work was done by clinicians with or without laboratory facilities, and generally by clinicians working in the full tide of practice, whose time for research had to be snatched in small sections or by means of rigid organization, and which because of this restriction must be used to the greatest effect.

Our knowledge of the nervous system has made enormous advances. Much of this is due to the laboratory work of the physiologists, but much more to the clinical physician and most to the neuro-surgeon, such as Harvey Cushing and his successors, who in this generation have built up a new branch of surgery which has brought great blessings to mankind as well as additions to our scientific knowledge. Another branch of modern development is orthopaedics, developed in England after the first World War, around and upon the work of that great clinician, Robert Jones.

Lister was a clinician and would not have grasped the adaptability of Pasteur's discoveries to surgery if he had been a pure

scientist. Maekenzie, who transformed our knowledge of heart disease, was a clinician and a hard working general practitioner during the time he made his greatest contributions to our knowledge.

The ideal professor of a clinical subject is a trained clinician with a scientific mind, one who can work with the scientist and understand his findings even if he is not able to carry on his own laboratory experiments. What seems to be futile is to appoint to these posts men with poor clinical training, as this cannot be supplied by clinical assistants without loss of prestige to the professor and moreover he, the head of a clinical department, is unlikely to appoint assistants with a better clinical training than himself and, if by accident he does so, it is unlikely that he would accept their guidance.

It should not be overlooked that one of the main functions of a professor of a clinical subject is to train students and that, unless he is a well trained clinician himself, his department will be a failure. It is right and proper to bring up the student with a scientific outlook, but he must be trained first and foremost to treat patients and it is wrong to give him the idea that scientific methods of examination can ever be more than aids to his clinical observations and examination.

What makes matters worse with us is that the English universities cannot offer salaries which compare with the income a good man would make in clinical practice, due in large measure to the understandable objection of distinguished professors in other faculties to professors of clinical medical subjects receiving so much more than they themselves do.

The reasonable answer would seem to be to allow the professor of a clinical subject a limited amount of private practice, which would not only increase his income, but keep him in touch with all classes of the community. This might entice good, well-trained men old enough to have proved their worth. As it is, young, untried men poorly trained in clinical medicine or older men who have failed as clinicians may be the only applicants, whose academic outlook may manifest itself in an inability to work more than from 10 a.m. to 5 p.m. and the ability to spend one or two hours in making a diagnosis which a trained clinician would do in half an hour.

What the answer will be I do not know. Some of the whole time men complain of the salaries they receive, and some threaten that they will throw up their posts and go into practice.

Another danger we must guard against in our teaching is to rely too much upon scientific aids. By all means have x-ray and all laboratory examinations done, but let these be adjuncts to clinical observation and examination. It is only by careful observation that the great clinician is made. We have all suffered from the enthusiastic radiologist who makes the diagnosis; what the clinician wants is a meticulous record of what the x-ray shows, he will make the diagnosis by fitting the x-ray and other tests into his own observations.

What is even more important is the danger that the scientific outlook may obscure the human approach: that we may be interested in our patients as scientific curiosities rather than as human beings. I think I can best illustrate what I mean by what I have observed in obstetrics. From 1905 to 1908, for three and a half years, I was resident obstetric surgeon to our large and ancient women's hospital in Manchester, Saint Mary's Hospital. In this post apart from patients in the hospital I was responsible for about 4,000 confinements in the patients' own homes. These confinements were attended by a staff of midwives who lived each in her own small district, but I took the responsibility for these patients during the confinement and for a month before and a month afterwards. Midwives are a class neither you nor any other Dominion nor the United States have much experience of.

At that time midwifery was scandalously poorly paid, and these women, therefore, were drawn from a social stratum little above that of their patients. They were poorly educated, most of them were married and had families of their own to look after. Their training in midwifery consisted of attendance at a course of lectures at our own hospital, attendance at a number of confinements with another midwife, and the passing of an examination held by this hospital.

In the theory of their profession and in antisepsis they left much to be desired. But in clinical knowledge they acquired great skill, and during the whole period for which I was responsible it was seldom that any of them over-

looked an abnormality or failed to notify me. Springing from a class little higher than their patients, they understood their domestic difficulties, and did not expect preparations beyond the patients' capability to provide. They devoted themselves body and soul to their patients, answering the first call, remaining with them throughout the whole labour, or returning at frequent intervals. Having families of their own they understood the natural trepidations of a primigravida facing the great unknown, and gave her confidence and encouragement when she required it. They knew all the little tricks for relieving discomfort and pain, and altogether were veritable sheet anchors to which their patients clung.

In 1902 the first Midwives Act was passed, though it did not come into full action until 1905. Under this a Central Midwives Board was set up to take responsibility for the training and examination of would-be midwives and for the supervision of midwives in practice. By easy stages the training and examination was increased, as was the pay and social position, and gradually the pupils were drawn from higher social classes with a much higher standard of general knowledge. Today the midwives are a highly trained, well educated body of women, who have received a long training and passed stiff examinations, and their salaries are very different to my midwives of forty years ago.

But with it something is missing. Instead of a middle aged woman with a family of her own, the pupil is young, unmarried, and most often a generally trained nurse who takes a scientific interest in her work. Her early training is entirely in hospital under Sisters, highly trained but unmarried and with such a scientific outlook that they are interested chiefly in the abnormal, or in the normal only when birth is imminent. In the first stage, the time when there is much discomfort, fear and anxiety, the patient is often left alone or in the company of one or two patients in the same state. A young probationer looks in from time to time to see that nothing seriously abnormal is happening, but she does not know how to give that confidence and encouragement so much needed at that time, while many Sisters only take a serious interest when this stage is over and the patient removed to the labour room for the actual birth. From a statistical standpoint these patients do well, but often there is a psychological scar. There is in-

creased scientific interest but a little more humane interest would not be amiss.

Forty years ago the training of medical students in obstetrics was lamentable. In the subsequent period this training has been greatly improved, as it has been with you but during this same period more and more of the normal midwifery practised in Great Britain has fallen into the hands of the midwives. You do not employ midwives, a doctor is engaged to attend each confinement, and I presume is present throughout the first stage, the time when his personality will be of the greatest benefit to his patient.

One other drawback to institutional obstetrics is the elimination of the husband. I believe that the anxiety through which the husband passes when he is in the house and frequently sees his wife, especially in the first stage, brings a realization of what the birth has meant to his wife, in a way impossible with delivery in an institution which excludes the husband. Moreover, having been absent during the whole process he feels that the child is more a part of himself than when it is handed to him fully launched upon the world some ten days or a fortnight later when his wife leaves the hospital. If the anxiety of labour is to remain the domestic cement which I believe it was intended to be, I believe we must either retain domiciliary midwifery or arrange for the husband to be admitted more freely to the institutions.

I have taken the midwife as an example not as the only type whose training has overstressed the scientific outlook. The same criticism may be made with the training of nurses in our general hospitals: much theory, a scientific outlook, sometimes forgetfulness that the patient is an individual, helpless and in distress, to whom the handing of a bedpan when called for may give more relief than the most scientifically carried out dressing.

I wonder if I dare quote an example told to me only a few weeks ago. A well known Englishman sent to the U.S.A. on a mission last year was found on the day he was to return to have a high temperature, and to be suffering from pneumonia. He was treated with the greatest care and consideration and transferred to a most expensive room in one of the best known hospitals. He was kept waiting some little time while the room was

prepared: then, put to bed in comfortable surroundings, he snuggled down with the one desire gratified, to lie undisturbed and at rest. But no, hardly had he got comfortably settled than two nurses appeared and forced him out of bed because they had forgotten to take his weight during the waiting period. No doubt a highly important scientific detail but one he would gladly have dispensed with.

Let me take one other and last example. One of the greatest advances in gynaecology in the last half century has been the improved treatment of cancer. When I was a resident a woman with cancer of the cervix was doomed. Then came Wertheim's hysterectomy, by which we were able to obtain about 40% alive at the end of five years of those in an operable stage. Some years later came radium, giving similar results but without the same postoperative discomfort, and applicable to more advanced cases. A tremendous advance in forty years, but no thoughtful man can be satisfied, or would dare to say that any individual case will be cured by either treatment.

We know, and the laity know, that a patient suffering from cancer is liable to recurrence no matter how early the disease may seem, and no matter what the treatment. I believe very strongly, therefore, that a patient should not be told the diagnosis, unless there is some definite business reason, and that he or she should be treated in the general wards mixed with other patients, and not segregated into special hospitals or wards where he will be surrounded only by patients suffering from this disease and some in advanced stages. Under these circumstances the patient who eventually proves to be cured is constantly looking for symptoms of recurrence, and life becomes a constant anxiety. During my active career I made it a rule to treat all my cancer cases, by operation or by radium, in the general wards mixed with other patients, and I was especially careful to treat here, with radium, some patients admitted for functional haemorrhage, as it was a proof that radium was not used only for cancer.

Just before the war our Government passed a cancer act. The war has prevented its application, but soon it will be in action. A great drive will be made to educate the people about the early signs of cancer, to persuade

them to come for diagnosis to cancer clinics, and to believe that early cases are curable.

The bureaucrat appears to class cancer with tuberculosis, of which early cases can usually be cured. Cancer is different: the earlier the case the more likely is the cure, but even under the most favourable circumstances this is far from certain. Some day a cure or preventive will be found. Until then we shall produce untold misery by encouraging cancerphobia and by segregating cases of this condition for treatment which we know in our heart of hearts will cure only a certain percentage. Here again the scientific outlook is overlooking the humane.

SUMMARY

In the last half century very great advances have been made, and what is of greater importance, we have developed a scientific outlook. It is most important that this continues and that it is used as a basis of the instruction of medical students. It has, however, its dangers, and we must be careful in our practice, and especially in our teaching and training of students, nurses and midwives, that this scientific does not entirely submerge the human outlook.

Science has done much, and will do more, but the main object of the clinician, his students, and above all his nurses and midwives, is the treatment of human beings, to cure them of their ills, to remove their fears and anxieties, and to relieve them of their pain and distress.

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PROBLEMS OF THE ANÆSTHETIST— HAZARDS IN THE USE OF ANÆSTHETICS*

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ONE of the factors in the development of anaesthesia as a distinct specialty in recent years was the realization of the countless hazards that a patient is subjected to in receiving any anaesthetic. Fifty years ago, the administration of ether was believed to be practically without risk. Since then tremendous progress has been made in the demonstration of hazards inherent in the administration

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of the various anaesthetic agents, and in the development of newer agents that are potentially less harmful to the patient.

Elam published statistics which show that in Great Britain the death rate from anaesthesia has actually increased as additional agents and techniques have been introduced. Part of the explanation for this anomalous situation lies in the fact that many untrained physicians have attempted to utilize these more modern techniques such as intravenous anaesthesia, cyclopropane with carbon-dioxide absorption, or high spinal anaesthesia, with disastrous results. They simply were not aware of the hazards of these techniques, which the trained anaesthetist would know how to avoid or treat should they occur.

All anaesthetics, regardless of the mode of administration, are potentially hazardous. The hazards involved in the use of any anaesthetic agent are influenced by such factors as, (1) nutritive and metabolic state of the patient, (2) technique or mode of administration, (3) dosage of drug, (4) duration of anaesthesia, (5) nature and site of operative procedure, and (6) the skill and knowledge of the anaesthetist.

General anaesthesia.—The changes produced by the general anaesthetic agents in the central nervous system are of a reversible, although as yet unexplained nature. As long as adequate oxygenation of the tissues is maintained, we are not damaging the nervous system to any detectable degree. Unfortunately, the same generalization cannot be made when the other systems of the body are being considered. The avoidance of hypoxia then may be regarded as the cardinal principle to be observed in the administration of any anaesthetic. Failure to do this can produce changes in all organs of the body. The central nervous system, particularly the cerebral cortex, is most readily damaged by impairment of its oxygen supply. Despite some clinical evidence to the contrary, it would appear most hazardous to restrict the intake of oxygen below 20 to 21%. Healthy robust individuals may tolerate an oxygen intake of as low as 14%, but the uncertainty of the tolerance makes this an exceedingly dangerous state to induce intentionally in any patient.

More recently the importance of the efficient elimination by the body of carbon dioxide

during general anaesthesia has been brought to our attention. Retention of carbon dioxide in the tissues may result from such factors as the use of partially exhausted soda lime in the absorption technique or from depression of respirations, the tidal volume being inadequate to ventilate properly the lungs with consequent gradual build-up of carbon dioxide in the body. Any dead space in the apparatus permits carbon dioxide accumulation, as does any degree of rebreathing in the absence of soda lime. The presence of a high oxygen tension in the tissues and blood interferes with the elimination of carbon dioxide from the tissues.

The toxic effect of increased carbon dioxide may manifest themselves in a variety of ways. The earliest evidence is an increased rate and depth of respirations, increased pulse rate, and elevation of the blood pressure. Waters believes that convulsions under general anaesthesia are frequently associated with carbon dioxide retention. Under cyclopropane, carbon dioxide "build-up" may occur due to the depressed respirations and high oxygen percentage in the inhaled mixture. When the anaesthetic is discontinued, allowing the rapid blowing-off of the carbon dioxide, there results a marked fall in blood pressure. This has been termed "cyclopropane shock" by Dripps.

In the presence of such potent respiratory depressants as cyclopropane and pentothal sodium, the respiratory signs may be completely masked, allowing alveolar concentrations of carbon dioxide to exceed 10 to 12%. Beyond this concentration, carbon dioxide is a depressant to the respiratory centre. These toxic manifestations of carbon dioxide serve to impress upon one the importance of maintaining an adequate tidal volume during all anaesthetics, and the strict avoidance of excess dead space in the apparatus.

Changes in blood.—The changes that occur in the formed elements of the blood constitute no danger to the well-being of the patient. The increased white blood count is a transient phenomenon occurring to some extent with all inhalation agents. The changes in chemical constitution of the blood by some general anaesthetic agents may be a source of grave danger, particularly to the handicapped patient—the diabetic, or dehydrated patient in a state of acidosis or impending acidosis.

Hyperglycaemia occurs in normal persons under ether anaesthesia; in diabetics there is an even greater elevation. Insulin is believed to be no longer effective in lowering the blood sugar in patients under ether. The mobilization of glucose results in a marked decrease in the heart muscle, striated muscle, and liver. It is agreed that ether is contra-indicated in the diabetic patient. Hence in the presence of diabetes, it is advisable to use agents that are less apt to produce marked hyperglycaemia, such as cyclopropane and nitrous oxide mixtures.

The tendency to produce acidosis by ether constitutes a further hazard to diabetic and dehydrated patients. Stehle and Bourne have demonstrated the discharge of phosphoric acid from the muscles under ether anaesthesia. This results in a diminution of the alkali reserve with a tendency to lowering of the blood pH.

The production of acidosis under cyclopropane is due to a somewhat different mechanism. Seevers *et al.* have shown that the carbon dioxide retention that occurred with cyclopropane due to a diminished respiratory exchange, resulted in a shift of the blood reaction towards the acid side. With the maintenance of adequate tidal volume and reduction in the dead space preventing the accumulation of carbon dioxide, this tendency to acidosis may be prevented to a considerable degree. Hence this need not constitute a dangerous factor in the anaesthetizing of the dehydrated, acidotic patient.

Liver.—The liver plays a two-fold rôle in the evaluation of any anaesthetic. The agent may either act directly on the liver in a deleterious manner or the liver may serve as a detoxifying base. Chloroform produces the greatest liver damage of any anaesthetic agent. Rosenthal and Bourne have demonstrated in dogs that chloroform always produces liver damage, and certainly this seems to apply equally to humans. Chloroform produces acute fatty degeneration with a rapid depletion of the liver glycogen.

Ether produces only transient mild impairment of liver function. Other inhalation agents have likewise been shown to produce little or no change if administered in the absence of hypoxia. Ravidin and co-workers were unable to demonstrate definite clinical evidence of liver damage by di vinyl ether. Nevertheless they advised against its use in the

presence of known biliary tract disease. Bourne and Raginsky found no impairment of function of the normal liver following the administration of avertin fluid. The use of smaller doses of avertin was recommended in the presence of impaired liver function of moderate degree, to avoid prolongation of the period of narcosis since the liver is the site of detoxification of tribromethanol.¹ The use of pentothal sodium in the presence of hepatic dysfunction does not appear to constitute any appreciable danger. Masson and Beland concluded from their investigations that pentothal sodium is detoxified in all tissues of the body, and not to any great extent in the liver. Nevertheless caution should be exercised in the administration of either of these agents in the presence of a diseased liver.

Kidneys.—Kidney function undergoes marked depression during anaesthesia regardless of the agent. This effect would appear to be due to extra-renal factors, rather than to any intrinsic damage to the kidneys by the anaesthetic used. Barbour and Bourne believed that the oliguria found with ether was due to the haemoconcentration. Studies by Coller and Moyer and co-workers with cyclopropane and ether have led to the conclusion that the depression of function is due to such factors as changes in acid-base balance, ionic distribution, and altered cardio-circulatory function. Coller, discussing this experimental work, stressed the dangers in the administration of normal saline during the anaesthetic and in the immediate postoperative period, in the absence of gross loss of electrolytes through vomiting or gastro-intestinal drainage. In the presence of depressed kidney function, the administration of excess saline adds a further strain on the kidneys leading to retention of the saline with production of tissue oedema, impaired wound healing, etc. Glucose solutions are given to promote diuresis.

Cardio-circulatory system.—To remain in common usage, an anaesthetic agent must have relatively no toxic effects on the heart. Transient alterations in the rhythm may be tolerated providing that it can be shown that they do not have a fatal termination nor show evidence of residual damage on removal of the anaesthetic. Levy was the first investigator to recognize that the not infrequent occurrence of cardiac arrest under chloroform was due to

the anaesthetic agent. He demonstrated in cats that chloroform sensitized the heart muscle, making it susceptible to ventricular fibrillation in the presence of some exciting cause. Use of adrenalin to control bleeding, or surgical stimuli during periods of light anaesthesia such as induction or reawakening, he found would result in ventricular fibrillation. More recently Meek *et al.* have stated that a more likely cause of death under chloroform in humans is a direct toxic effect on the myocardium resulting in cardiac failure with no evidence of a terminal ventricular fibrillation.

Considerable work by laboratory and clinical investigators has been done on the arrhythmias developing under cyclopropane. Meek found in dogs that deep cyclopropane anaesthesia sensitized the heart to the effects of adrenalin to a greater degree than light cyclopropane. Atropine can only delay the appearance of the ventricular tachycardias after the use of adrenalin. Further studies would appear to demonstrate that no residual damage occurs as a result of the arrhythmias. Robbins and Baxter found that if anoxæmia is avoided by artificial respiration, if necessary, then arrhythmias did not develop even in deep cyclopropane anaesthesia. Vago-vagal reflexes produced by mechanical irritation of the trachea by intubation or tracheal aspiration are prone to result in ventricular extra-systoles and tachycardia: cyclopropane appears to be the greatest offender. Some degree of protection is offered by pre-anaesthetic atropinization to decrease vagal tone.

The problem of anaesthesia for thyro-cardiac patients requires special consideration inasmuch as the heart muscle is in a highly sensitized state as a result of the long-standing thyrotoxicosis. Lahey has reported ventricular fibrillation occurring when cyclopropane has been the anaesthetic; the use of an ethylene-ether combination has been recommended. Tovell feels that cyclopropane is safe providing that a small amount of ether is added as a protection for the heart.

Respiratory system.—Depression of respiration during anaesthesia is a hazard that is continuously confronting the anaesthetist due to the deleterious effects it may have on the oxygen supply and the carbon-dioxide elimination. Respiratory depression is not uncommon with cyclopropane since it lacks the irritants

of ether. Due to the high oxygen usually administered with cyclopropane, there is little danger of hypoxia developing but the impairment of carbon dioxide elimination may be a source of danger to the patient, as previously discussed.

The respiratory depressant action of pentothal sodium constitutes a definite hazard when administered to patients with advanced respiratory tract disease or respiratory distress, and should be avoided. Respiratory failure under pentothal sodium has been studied extensively by Beecher and Moyer. They found with prolonged pentothal anaesthesia a gradual retention of carbon dioxide and a decline in the arterial oxygen saturation. The normal sensitivity of the respiratory centre to carbon dioxide is lost; narcotic concentration (over 10%) may actually be found. Hypoxia now becomes the stimulus to respiration, acting through the earotid body. In the presence of this high carbon dioxide and low oxygen, small supplementary doses of pentothal for maintenance may produce a far greater effect than normal, resulting even in cardio-respiratory collapse. Apnoea results if oxygen is administered to these patients since the sole remaining drive to respiration—hypoxia—is removed. Maintenance of adequate tidal volume and avoidance of hypoxia must be assured in any prolonged pentothal anaesthesia.

The overactivity of the para-sympathetic nervous system under pentothal sodium resulting in laryngospasm has been studied in the cat by Burstein and Rovenstine. Pre-anæsthetic atropinization was found to block effectively this vagal overactivity. They believed that a similar basis exists in humans for the laryngospasm seen in humans under pentothal sodium.

The presence or absence of hazards in the use of ether for anaesthesia in cases of pulmonary tuberculosis appears to be the source of some disagreement among anaesthetists. Beecher and Adams maintain that ether, properly given in a closed system, is the safest anaesthetic: evidence is lacking that ether, more than any other agent, in any way contributes to the spread of the pulmonary tuberculosis.

The administration of clinically effective doses of avertin is followed by marked respiratory depression. The patient must be constantly observed to guard against upper

respiratory obstruction being super-imposed on the respiratory depression.

Convulsions in anaesthesia.—The occurrence of convulsions under general anaesthesia in otherwise normal individuals is an unsatisfactorily explained phenomenon. However with the administration of 100% oxygen, withdrawal of the agent, and the prompt intravenous injection of a soluble barbiturate, there is generally a successful termination of the convulsion with no residual damage. Convulsions may occur under any general anaesthetic and have been attributed to a variety of causes. Rosenow and Tovell have demonstrated the presence of a neurotropic streptococcus as a causative factor in patients who have had convulsions. Waters has claimed that carbon dioxide retention is usually a feature of the anaesthetic course during which convulsions have occurred. In an analysis of 12 cases, Ray and Marshall have concluded that hypoxia is a precipitating factor. Bourne believes that in convulsions under ether, haemococentration may be a causative factor.

The basis for any convolution is probably the result of a combination of factors, but the observance of such basic principles of inhalation anaesthesia as avoidance of hypoxia and carbon dioxide retention should result in an even further lowering of the incidence of convulsions.

Anæsthesia in shock.—The administration of anaesthesia to patients in a state of shock certainly is “adding insult to injury” but is often unavoidable. The choice of agent then becomes of vital importance. Cyclopropane with its high oxygen percentage is recommended by some. Skilful administration of pentothal and nitrous oxide may be advantageous due to the relative non-toxicity of this combination. Experimentally, it has been shown that dogs die more readily from haemorrhage under spinal than under ether anaesthesia. Beecher, in a review of the whole problem, has concluded that ether is the choice of agent if general anaesthesia must be used.

Explosive hazard.—The administration of any explosive inhalation agent constitutes, potentially, a serious hazard. Only chloroform and trilene are non-explosive and non-inflammable. Nitrous oxide is non-explosive but supports combustion. Unless precautionary measures are taken, there are many potential sources of ignition in the operating theatre. The various

forms of electrical equipment—cautery, x-ray units, suction and blower apparatus, and wall plugs, switches, and electrostatic discharges are the two major sources of ignition. Greene has reported in an analysis of 230 fires and explosions that all were preventable by the use of measures known at the time. The seriousness of the explosive hazard cannot be too greatly stressed. Here, as nowhere else, one should learn from the misfortunes of others. It is the duty of anaesthetists and hospital authorities to adopt all known precautions against the occurrence of explosions and fires in the operating rooms.

Regional anesthesia.—The "local" anaesthetic drugs have provided surgeons and anaesthetists with a relatively controllable anaesthetic agent. The specificity of the action of these drugs on nervous tissue reduces to a minimum their systemic effects if administered in properly controlled dosage. The relative toxicity of the individual agents is affected by such factors as site of injection, amount of drug used, concentration of solution, and presence or absence of a vasoconstrictor. Inasmuch as the liver is the site of destruction of all local anaesthetics, the speed with which it can detoxify the drug is also of vital importance in determining the toxicity. The appearance of restlessness, nausea, vomiting, and tremors in many patients after local anaesthesia, may be evidence of central nervous system irritation. This may progress to convulsions, and possible death if treatment is not promptly instituted. The administration of oxygen and an intravenous barbiturate will successfully control such central irritation. All local anaesthetic agents such as cocaine, procaine, metocaine, pontocaine, or nupercaine, may produce evidence of central nervous system irritation. These may occur if the rate of injection or absorption from the site of injection exceeds the rate of destruction by the liver.

Cardiovascular effects are most common following cocaine, resulting in tachycardia and vasoconstriction of central origin. If the dose of cocaine is large or absorption rapid, cardiac collapse results. Acute cardiac arrest is rare, being totally unrelated to the dose of cocaine used. Toxic symptoms following procaine, metocaine or pontocaine less commonly manifest themselves in the cardiovascular system. Nupercaine, if administered in large doses,

may result in depression of cardiac function leading to cardiac arrest. Considerable evidence, clinical and experimental, has accumulated showing that procaine is the safest of all the local anaesthetic drugs.

Spinal anesthesia.—By far the most hazardous type of regional anaesthetic techniques is spinal anaesthesia, the hazard increasing greatly with increasing height of anaesthesia. The choice of agent is subjected to the same considerations of toxicity as discussed above. Howard Jones has stressed the importance of reducing the concentration of the drug used in toxic or debilitated patients since their reaction to any given strength of drug is much greater than that of the normal individual.

The outstanding hazard of spinal anaesthesia is its adverse effect on the cardiovasculär system. The consistency and degree of the fall in the blood pressure increases with increasing height of anaesthesia. Papper, Bradley, and Rovenstine have critically reviewed the entire problem and have concluded that the induced changes are the result of a post-arteriolar stagnation of blood. The maintenance of the diastolic pressure, lowered cardiac output, increased arterio-venous oxygen difference, and increased circulation time are all evidence of impaired venous return to the heart. The prophylactic use of ephedrine to counteract these changes is recommended. Bieter maintains that ephedrine is less efficient if given after these cardiocirculatory changes have occurred. The incidence of the fall in blood pressure following spinal anaesthesia has been estimated at 70%.

CoTui and Burstein have presented evidence of the instability of the circulatory system under spinal block. Changes in position should be made with the utmost care. Haemorrhage is poorly tolerated by animals under spinal anaesthesia, particularly high spinal anaesthesia where practically the entire compensatory mechanism is blocked. Furthermore, Papper *et al.* were able to show that the fall in blood pressure with high spinal anaesthesia (above D-6) is much greater and more common where operation is performed than when it has not been done. The need for gentle handling of tissues is clearly indicated.

Undue spread of the anaesthetic with increasing paralysis of the intercostal muscles is a grave hazard if unattended by prompt and

adequate therapy. The greatly diminished respiratory exchange may result in a serious degree of hypoxia with a further depression of the blood pressure. The inhalation of carbon dioxide for stimulation of respiration is contra-indicated since it results in a further lowering of the blood pressure due to peripheral vaso-dilatation. The normal reaction to carbon dioxide of vaso-constriction with elevation of the blood pressure, mediated through the carotid body, is prevented by the blockage of the vaso-constrictor fibres.

Clinical neurologic sequelæ of spinal anaesthesia are a rare but serious hazard. A wide variety of lesions have been reported, ranging from headache to permanent paresis. Nicholson and Eversole have shown that pooling of a concentrated solution of an anaesthetic agent in the sacral portion of the sub-arachnoid space is prone to produce at least transient nerve damage. It is not considered advisable to administer a spinal to any patient who shows evidence of pre-existing central nervous system disease. The anaesthetic agent acts as an irritant that may aggravate an otherwise quiescent lesion. The occurrence of these neurological lesions of a remote or immediate nature is rare, and should not constitute a contra-indication to spinal anaesthesia except as noted above.

The incidence of headache following spinal anaesthesia (and lumbar puncture for diagnostic purposes) has been reported as varying from 0.1 to 83%. Lemmon has reported an incidence of 3% following continuous spinal. The etiology is uncertain. Though usually of a mild self-limiting nature, it nevertheless constitutes a real hazard for which there is no special prophylaxis.

Curare.—This recently introduced drug possesses relatively few hazards. Respiratory depression has been reported by many anaesthetists. Curare should never be administered if the facilities are not readily at hand for performing efficient artificial respiration. If curare is administered during ether anaesthesia, the dose must be reduced to one-third of that commonly used with cyclopropane. When used by experienced anaesthetists, with facilities for maintenance of an adequate respiratory exchange if the need arises, curare appears to be one of safest drugs we have.

SUMMARY

An attempt has been made to present some of the hazards and untoward side-effects, particularly those having a pharmacological and physiological basis, that may be encountered in the use of the common anaesthetic agents and techniques.

Avoidance of many of these hazards lies mainly in the careful choice of agents or combinations of agents and their skillful administration. Despite the introduction of many potentially safer agents, the skill and knowledge of the anaesthetist is still a vital factor.

NOTE.—An extensive bibliography has been prepared and will appear in the reprints supplied to the author.

RÉSUMÉ

Revue des principaux dangers que présente l'anesthésie, et rappel de leurs fondements physiologiques et pharmacologiques. La prévention des accidents au cours de l'anesthésie dépend, tout autant que du choix des anesthésiques, de leur habile administration. En dépit de l'apparition de nouveaux produits d'une grande sécurité, l'art et la science de l'anesthésiste restent des fauteurs de premier plan. PAUL DE BELLEFEUILLE

A NEW SYNTHETIC ANTI-HISTAMINE SUBSTANCE DERIVED FROM PHENOTHIAZINE (Phenergan, 3,277 R.P.)*

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THE name phenergan (3,277 R.P.) has been given to the N-dimethylaminopropyl derivative of phenothiazine. The anti-histamine properties of this synthetic substance were discovered in France in 1946¹ and have been intensively studied there since then.^{2, 3}

Historical survey.—The first synthetic substance reported to possess antihistamine properties was described by Fourneau and Bovet in 1933⁴ and later by Staub and Bovet in 1937.⁵ This was 929 F. or thymoxyethyl-dimethylamine. In 1937, Bovet and Staub⁶ also described 1,571 F. a derivative of ethylene diamine. Both these substances showed only moderate activity and were too toxic for therapeutic administration.

In 1942 Halpern⁷ showed that N-dimethylaminoethyl-N-benzylaniline (antergan of 2,339 R.P.) was more powerful and less toxic than the earlier products and the first clinical trials were attempted.

During the years which followed, various modifications of Halpern's drug were produced, such as neo-antergan (Bovet and Walther, 1944⁸), benadryl (Loew, Kaiser and Moore, 1945⁹) and pyribenzamine (Mayer, Huttner and Scholtz, 1945¹⁰). Numerous comparative

* From the Clinique Médicale Propédeutique, Hôpital Broussais, Paris (Professeur Pasteur Vallery-Radot).

studies have been made, notably by Code¹¹ and by Feinberg,¹² as well as the many studies on the experimental activity of each substance separately.^{13, 14, 15}

In 1946, Halpern and Duerot¹ showed that certain phenothiazine derivatives possessed anti-histamine properties which were in many respects more powerful than those of any previously described substance. A series of experiments was made to study the activity of this new group of substances, particularly N-dimethylamino-2-propyl-1-phenothiazine, known as 3,277 R.P. or phenergan.

Experimental findings.—Phenergan possesses the same well-established properties as the other anti-histamines, but quantitatively its action is much more powerful in many respects. Its antagonism to histamine is well shown in experiments on the smooth muscle of the bronchii, intestine and uterus and by its inhibition of the triple response of Lewis and of the histamine effect on the blood-pressure.^{7, 9, 21, 23} The degree of protection against histamine conferred by phenergan is much greater than that given by any other anti-histamine substance. In guinea-pigs, for example, a dose of phenergan of 20 mgm. per kilo. protects the animal against 1,500 times the lethal dose of histamine.¹⁶

The anti-anaphylactic effect is equally striking. Phenergan counteracts anaphylactic shock and prevents the Prausnitz-Küstner reaction. This action is much greater than that of the other anti-histamine substances. The duration of action against experimental asthma in the guinea-pig is 3 times as long as the action of antergan or neoantergan under the same conditions. Phenergan, like the other anti-histamine substances, cannot however counteract the effect of histamine on the secretions. The animals given large doses of histamine after the administration of phenergan show no immediate signs of histamine shock, but a considerable gastric hypersecretion is produced. This probably explains the constant appearance of gastric ulcerations under such conditions.¹⁵

Last and Loew (1947¹⁶) had already demonstrated by Menkin's method that benadryl and neo-antergan counteract the local increase of capillary permeability induced by histamine. By noting the penetration of fluorescein into the anterior chamber of the eye¹⁹ and the diffusion of dyes into peritoneal exudates,²⁰ it has been shown that phenergan powerfully opposes the increase of capillary permeability produced by histamine and various other substances.

Two special effects of phenergan, possibly due to its more powerful action on capillary permeability, have been investigated. (a) Phenergan prevents the appearance of the acute pul-

monary oedema which is indeed in unprotected animals by intravenous epinephrine^{21, 25} or by certain poison-gases, such as chloropierin or phosgene.²² (b) Phenergan prevents the induction of experimental orthostatic albuminuria in rabbits.²³

CLINICAL STUDIES

Methods.—Phenergan was administered orally in the form of 25 mgm. tablets. The usual dose varied between 25 and 100 mgm. daily, but in certain cases, up to 200 mgm. were given. Blood counts were carried out before and every 2 weeks during treatment. Allergic, clinical and skin-tests were carried out before and during treatment whenever possible.

Results.—(a) *Serum sickness:* 7 cases of serum sickness were treated. In each case the skin manifestations such as pruritus and urticaria, disappeared within from 30 minutes to 3 hours after administration of the drug. Joint pains were present in 4 patients and disappeared under treatment in only 2 of the cases. The fever was scarcely influenced.

(b) *Urticaria:* 123 cases of urticaria of varying origin have been treated. In only 12 of these cases could an allergic basis be demonstrated by clinical and cutaneous tests; 108 cases (87.8%) showed immediate improvement. The pruritus was the first symptom to disappear, then the skin reaction tended to diminish and had often entirely disappeared after a few hours. Of the remaining 15 patients, 6 showed signs of intolerance and were unable to continue treatment, while 9 cases were little, or not at all, benefited by the drug. All the cases of definitely allergic origin improved under treatment, but among the successes were several cases in which there was no reason to suspect any such cause. About 60% of the successful cases had previously failed to respond to neo-antergan.

(c) *Angio-neurotic oedema:* Out of 19 cases of angio-neurotic oedema, only 3 were not improved by treatment (84% of favourable results). Two of the successful cases were patients in whom oedema of the lips had persisted in between the acute exacerbations. Apart from these cases of true angio-neurotic oedema, there were 2 patients who suffered a local oedema after the slightest pressure to any part of the body. These cases were uninfluenced by phenergan.

(d) *Pruritus:* Out of 18 cases of prurigo from varying causes, 6 were uninfluenced by phenergan, but 12 were vastly improved, the

pruritus ceasing even when the visible lesions persisted unchanged. Included in these 12 are several cases of pruritus due to scabies.

(e) *Eczema*: None of our 17 cases of chronic eczema was completely cured by treatment. In a few cases slight relief was obtained, especially from the subjective symptoms such as pruritus. Out of 22 cases of acute eczema and contact dermatitis, 3 showed rapid improvement which ended in complete cure. The rest of the cases improved only after a much longer period and it is difficult to assess the influence of phenergan on these results. Three cases of arsenical and one case of gold erythrodermia showed no real improvement on treatment with phenergan.

(f) *Allergic purpura*: One case of allergic purpura, in which new crops of petechiae appeared daily for three weeks before treatment, was treated with phenergan. Administration of the drug was followed by immediate cessation of fresh eruptions.

(g) *Hay fever*: 142 cases of hay fever were treated between the spring of 1947 and that of

1948; 98 cases (69%) showed complete disappearance of all signs and symptoms; 36 cases were only partially relieved; the sneezing ceased but the nasal congestion remained more or less the same: 8 cases were completely unchanged by treatment but most of these were unable to tolerate full doses of the drug.

It should be noted that, in the majority of cases, 25 mgm. of the drug daily suppressed sneezing, but a dose 4 to 6 times as great is usually necessary to give complete relief from all the symptoms. For a few patients, however, 6 to 12 mgm. daily sufficed to suppress all symptoms.

At a recent meeting of the French Society of Allergy (June 15, 1948) Pasteur Vallery-Radot, Blamoutier and B. N. Halpern have reported a series of 200 cases of hay fever treated with phenergan with a dose of 25 to 50 mgm. daily; they reported 86 per 100 of excellent results with relief of all symptoms; only in 14 per 100 the improvement was incomplete.

TABLE OF RESULTS

Condition	Total No. treated	Cure		Improvement		Failure	
		Actual No.	Percentage	Actual No.	Percentage	Actual No.	Percentage
(a) Serum sickness	7			7	100.0	0	0
(b) Urticaria							
(1) Definitely allergic	12			12	100.0	0	
(2) Etiology unknown	111	<—————	12—————>	86.5	15	13.5	
Total	123	<—————	108—————>	87.8	15	12.2	
(c) Angioneurotic oedema.							
Pressure oedema	19	<—————	16—————>	84.0	3	16.0	
2	0	0		0	2		
(d) Pruritus	18	<—————	12—————>	67.0	6	33.0	
(e) Eczema							
(1) Acute and contact	22			3	13.6	19	86.4
Chronic	17	0		0	0.0	17	100.0
Total	39			3	7.7	36	92.3
(2) Gold and arsenic erythrodermia	3	0		0		3	
(f) Allergic purpura	1	1					
(g) Hay fever	142	98	69	36	25.3	8	5.7
(h) Asthma							
(1) Definitely allergic	9			9	100.0	0	
(2) Etiology unknown	63	<—————	21—————>	33.3	42	66.6	
Total	72			30	41.7	42	58.3
(i) Spasmodic cough	9	0		0		9	100.0
(j) Migraine	20			6	30.0	14	70.0
(k) Other conditions—Acute and subacute rheumatism, tuberculous allergy, acute glomerulo-nephritis—uninfluenced							

(h) *Asthma*: 72 cases of asthma were treated, but an allergic basis could only be demonstrated in 9 of them. In all these 9 cases, considerable relief or even complete disappearance of the asthma was obtained. In 21 other cases without any appreciable allergic origin, there was a certain degree of improvement. In the remaining 42 cases, the results were completely negative.

(i) *Spasmodic cough*: 9 cases of spasmodic cough were entirely uninfluenced by treatment.

(j) *Migraine*: Out of 20 cases of migraine, 6 were improved by phenergan. It was impossible to determine an allergic basis for any of these 6 cases.

(k) Phenergan appeared to have no effect on chronic or sub-acute rheumatism or on acute glomerulo-nephritis. It did not seem to influence the allergic manifestations of tuberculosis, or the intradermal tuberculin test. This latter observation is in contrast to its action on allergic skin tests for other diseases. In such cases, whenever skin tests were found to be positive before treatment, immediately after adequate dosage with phenergan they became transitorily negative.

TOLERANCE AND SIDE-EFFECTS

The drug was usually well tolerated. In particular, it did not provoke the digestive upsets which often occur with the other anti-histamine substances. The blood-picture was only affected in 2 cases, a slight neutropenia being observed. Administration of the drug was immediately stopped. The only important side-effects were of nervous origin. About 25% of the patients showed a slight degree of drowsiness accompanied by vertigo and instability when standing upright and by sensations of drunkenness. Occasionally there was also a slight decrease in intellectual power. In rare cases insomnia occurred rather than drowsiness.

These troubles, which are impossible to predict and which may occur even with feeble doses, constitute the most serious disadvantage to the use of phenergan. Usually they seem to be partially neutralized by the simultaneous administration of benzedrine. Moreover, the nervous troubles almost always disappear within a few days, even if treatment is continued with the same dose. The drowsiness may be neutralized if phenergan is given at

night. This effect wears off before morning but the true action of the drug continues throughout the following day.

DISCUSSION

The experimental and clinical results described above lead us to consider phenergan as a powerful anti-allergic substance. However, several conditions in which no allergic cause could be demonstrated were influenced by the drug. These were: (a) experimental syndromes such as acute pulmonary oedema due to epinephrine or poison-gas; orthostatic albuminuria; (b) clinical cases of migraine, certain skin conditions and some asthmas. On the other hand, a certain number of definitely allergic conditions were not benefited by the drug, for example, all chronic and most acute cases of eczema.

In consequence, the problem of the mechanism of action of phenergan still has to be elucidated. The first theory was that histamine is responsible for non-allergic syndromes influenced by phenergan. Up to the present there has been no serious proof of this. The experimental work described above suggests that phenergan acts on capillary permeability. In this connection, it is very striking that most of the pathological conditions controlled by phenergan are characterized by serious extravasation through the capillary wall—for example, experimental acute pulmonary oedema and orthostatic albuminuria, urticaria and even, perhaps, migraine.

SUMMARY

1. Experimental work on phenergan, a phenothiazine derivative which is a powerful new anti-histamine substance, is described. Apart from its action on allergic conditions, it prevents the production of experimental acute pulmonary oedema and orthostatic albuminuria.

2. Clinical trials with this substance proved it to be of value against serum sickness, urticaria, angioneurotic oedema, hay-fever and allergic purpura. Less success attended the use of phenergan in cases of asthma, migraine and various types of pruritus, with almost none against the eczemas.

3. The mechanism of action of phenergan is discussed. The experimental and clinical evidence are in favour of its action on capillary permeability.

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ARE THERE NUTRITIONAL PROBLEMS IN CANADA?

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THERE are so many nutritional problems in Canada that it is possible to discuss only a few of them in any detail. These nutritional problems may be considered in two large groups (1) problems of a general nature, and (2) problems of a specific nature. The general problems will require long term programs for solution, the specific problems, such as the extent of vitamin deficiencies in the population, are of immediate concern to every practitioner who is interested in the best possible prognosis for his patient.

Malnutrition has been compared with an iceberg in which only a small amount appears obviously on the surface, and a much larger amount lurks hidden. In this respect it is no

different than other diseases, in which the problem is indicated only to a very limited extent by statistics of mortality rates for example.

TABLE I.
NUMBER OF DEATHS ASCRIBED DIRECTLY TO
NUTRITIONAL DEFICIENCY DISEASES IN CANADA,
1937 TO 1946 INCLUSIVE

	Scurvy	Beriberi	Pellagra	Rickets	Osteomalacia
1937	7	1	2	54	5
1938	11	1	2	61	4
1939	11	2	6	49	4
1940	6	1	3	66	5
1941	3	4	4	48	5
1942	2	3	2	45	1
1943	6	1	4	37	1
1944	4	1	3	34	1
1945	5	2	5	22	3
1946	1	3	3	29	4

To the basic figures in Table I must be added many other types of malnutrition which do not reach the records as the primary cause of death, although they may be serious in various ways. These other types include iodine deficiency and simple goitre, riboflavin deficiency and lesions in tongue and eyes, iron deficiency anaemia, underweight and thinness, which give poor reserves, overweight and obesity with their proved danger to health and longevity, protein deficiency with many concomitant effects in relation to wound healing, immunity, etc., and various other vitamin deficiencies.

All of these milder types of malnutrition have been found in Canada, from British Columbia to Nova Scotia and among all economic levels. An average figure for their incidence is not yet possible, but nutrition surveys are gradually completing the picture. Surveys have been carried out by the Department of National Health and Welfare using methods already described, and some of the results are presented in Table II. These results are not presented here for detailed discussion, since this would take too long, but only to emphasize that nutritional problems are found all over Canada, and that they vary in their extent from one area to another, even in the same Province. To these results of ours should be added the medical nutritional surveys by McHenry and his colleagues in Toronto, and less complete studies by others. I do not include the evidence obtained by various people all over Canada as a result of food studies alone, because it is not possible to

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interpret such dietary surveys in terms of actual or potential malnutrition with the same degree of assurance that is possible when the patient is seen and his blood tested, as in our nutritional surveys.

RICKETS STILL A PROBLEM

It can be seen in Table II that *rickets* is still a problem in Canada. Not the florid rickets of the first 6 months of life, but rickets nonetheless. This was shown by the mortality figures in Table I, but it is even more emphasized in Table II. In some areas one of 3 children, in other areas one out of 20 show permanent bony deformities that have been described as *rachitic*. This is in accord with our dietary

Vitamin deficiencies, other than of vitamin D, and riboflavin, are rarely diagnosed. This is especially noteworthy in the case of the B vitamins, niacin and thiamine. Pellagra, as such, is very rare in Canada, and evidence of even mild deficiencies are not nearly as common as reported in the United States. This fact is important in relation to the controversy on adding three B vitamins to flour and bread, a practice started in the United States during the war, but which is forbidden in Canada. Convincing evidence for adding niacin or thiamine to flour or bread in Canada is not available, and the third one—riboflavin—is readily obtainable from milk, whether directly or added to bread.

TABLE II.
SOME OF THE NUTRITIONAL DEFICIENCIES FOUND BY DIRECT SURVEY IN DIFFERENT AREAS IN CANADA. (TOTAL NUMBER OF PEOPLE SURVEYED IS OVER 6,000).
FIGURES GIVE PERCENTAGE OF THOSE SURVEYED IN EACH GROUP

Definite or probable deficiency	British Columbia (children only)	One area in Alberta (all ages)	Saskatchewan (children only)	Two areas in Saskatchewan (all ages)	One area in Ontario (all ages)	Two areas in Quebec (children only)	One area in Nova Scotia (all ages)
Riboflavin.....	20.0%	5.0%	22.0%	3.0% 1	0.6%	23.0% 10	8.0%
Thinness.....	14.0	2.0	11.0	4.0 4	12.0	13.0 14	4.0
Past rickets.....	11.0	30.0	12.0	19.0 22	4.0	16.0 10	13.0
Low haemoglobin..	8.0	5.0	3.0	8.0 14	11.0	5.0 4	6.0
Vitamin A deficiency.....	7.0	0.0	9.0	1.0 0	8.0	3.0 2	2.0
Ascorbic acid deficiency.....	0.7	0.0	3.0	0.6 3	0.0	0.6 1	5.0
Protein deficiency.....	0.7	0.0	0.1	0.0 0	0.0	0.0 0	0.9
Niacin deficiency..	0.0	0.0	0.0	0.6 0	0.0	0.0 0	0.6
Thiamine deficiency.....	..	0.0	..	0.0 0	0.0	0.0

Carious teeth, poor posture, obesity, simple goitre and other problems were also encountered.

findings that 37 to 91% of all children, even in the first year of life, were getting no source of vitamin D.

Fish liver oil, or some other source of vitamin D is one of the most specific preventive measures available in medicine. This lack of vitamin D is not our only nutritional problem in Canada, but it shows a neglect that makes it one of our most important problems right now. A lack of food, leading to underweight and a lack of subcutaneous tissue which we combine in the term "thinness" is a constant finding in a percentage of people, especially children.

A lack of riboflavin is often diagnosed, although there are dramatic differences in its incidence in different parts of Canada.

OVERWEIGHT A PROBLEM

Overweight is a problem of great importance. It shortens life, decreases efficiency at work, increases liability to many diseases: cardiovascular disease is more common: 70% of diabetics are overweight: gall stones and biliary tract infections are more common: hernia, diverticulitis, bronchitis and emphysema are all more common or more difficult to treat in stout subjects: pneumonia and other infections are more dangerous: and the mortality rate in surgery rises. The exact extent of overweight in Canada is not easy to determine from our results so far, partly because the standard to use is in some doubt, but rarely have we encountered "overweight" in less than 10% of the adults in a given area.

Even among adults there is a problem of underweight among a great many people. Sometimes there are just as many underweight as overweight people in an area. In both cases plus or minus 10% from the usual medicolegal tables is allowed as normal.

GENERAL PROBLEMS IN NUTRITION

Those are some of the specific nutritional problems in Canada. In concluding I wish to refer to a couple of more general problems. The first is the lack of adequate nutrition training in medical schools. Nutrition gets a mention in several different courses in medical training, and this is the proper way to handle it. But there is a need in every medical school for a nutritional specialist whose duty it is to see that the various bits and pieces fit together, so that the graduate sees the subject as a whole as well as in its various applications. In only a few American universities, and no Canadian, has such a senior position been established. This is one of the real problems for the future.

A second general nutritional problem, partly resulting from the lack of training mentioned above, is the fact that most hospital diets (based on the few studies available) do not even meet the minimum needs of patients, let alone providing the hyperalimentation that can contribute to early convalescence and can reduce complications and mortality. Every hospital food service should be so well staffed, equipped and financed that it can make the very real therapeutic contribution of which it is capable. Very few are doing it at the present time.

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Infrared photography has been used to study the superficial venous pattern which may be altered by any condition which affects the circulation; 100 patients with breast complaints entering a dispensary from a cancer detection clinic were studied with the purpose of ascertaining (1) whether the pattern of the superficial veins of the thorax would be altered or disturbed by a tumour within the breast, (2) Whether the tumours were malignant or benign, and (3) whether infrared photography might be of practical assistance in the diagnosis of cancer. Infrared Photographic Study of the Superficial Veins of the Thorax in Relation to Breast Tumours. A Preliminary Report. Massopust, Leo C., *Surg., Gyn. & Obst.*, 86: 54, 1948.

THE USES OF STREPTOMYCIN IN UROLOGY*

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PART II.—THE ORAL USE OF STREPTOMYCIN AND SULFATHALIDINE IN URETERO-INTESTINAL TRANSPLANTS

IT has been shown by Morton² that by the oral administration of streptomycin, the floral content of the bowel can be reduced to an exceedingly low level, and in many cases after administration no growth was obtained on culture of the stool (see Fig. 1). To achieve this, preparation of the bowel is commenced one week prior to operation by giving sulfathalidine orally. In addition streptomycin, 4 grams daily, is given orally (in orange juice) commencing 3 days prior to operation.

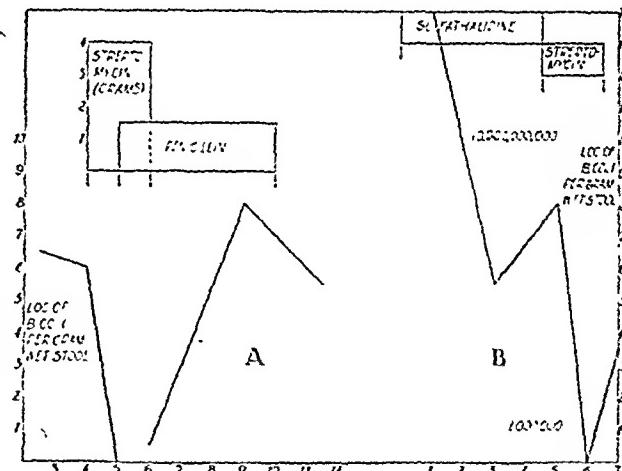


Fig. 1.—(a) The effect of streptomycin orally on *B. coli* in the stool. Note the return of growth when streptomycin orally is discontinued and penicillin is given intramuscularly (modified after Morton²). (b) Initial sharp decline in growth of *B. coli* in bowel, by using sulfathalidine orally; and the further marked decrease to zero when streptomycin orally is added.

We have used this technique with slight variations, in 3 cases of uretero-intestinal transplants in which 4 operations were done. In our cases the initial preparation was with sulfathalidine, followed by streptomycin, 2 grams daily, orally, for 3 days prior to operation and continued for 2 days postoperatively. Cultures were taken from the lumen of the bowel at the time of opening the bowel. Three cases are presented.

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CASE 1

G.B., aged 53 years. This patient was admitted to the Royal Victoria Hospital on August 1, 1946, complaining of frequency every hour, burning micturition, and terminal haematuria of six months' duration. He gave a history of having had the left kidney removed 33 years previously for tuberculosis. Physical examination was essentially normal, except for the genito-urinary organs. The penis, testes and epididymis were normal. On rectal examination the sphincter tone was normal. The prostate was found to be small, irregular and very firm. The prostatic fluid was loaded with pus cells and red blood cells. He was thought to have a tuberculous prostatitis and probably tuberculosis in the sole remaining kidney. A cystoscopic examination was done on August 7. The findings were as follows:

Filiforms and followers were passed with relative ease, although on a previous occasion the stricture in the bulbous portion of the urethra could not be passed. A French No. 21 cystoscope was then introduced. The trigone and ureteral orifices were normal in appearance. Clear urine was seen to come from the right ureteral orifice. The bladder wall elsewhere showed no evidence of tumour, ulceration, diverticulum or stone. Previous intravenous pyelogram series showed a double renal pelvis and a double ureter on the right, which fused in the lower third. Retrograde pyelograms were therefore not done.

Conclusion.—Double renal pelvis and double ureter, right, incomplete.

Repeated guinea pig inoculations and cultures of 24 hour specimens of urine carried out over a period of months, were entirely negative for tubercle bacilli. Repeated dilatations of the urethra and cystoscopic examinations were done at approximately monthly intervals. He was given intensive chemotherapy with sulfonamides, penicillin and streptomycin. During this 6 months period the bladder capacity gradually decreased in size, until the patient was finally voiding 42 times in 24 hours. It was felt that this patient probably had an interstitial carcinoma of the bladder, in spite of the fact that there was no evidence of this cystoscopically, and that he had had a previous nephrectomy for tuberculosis. A ureteral-intestinal transplant and total cystectomy was therefore recommended. The ureteral intestinal transplant was carried out on the right side extraperitoneally on September 22. The bowel had been prepared preoperatively with sulfathalidine and streptomycin. A culture of the bowel content taken at the time of operation showed "no growth" of organisms.

Postoperatively the patient had a most interesting and complicated course. No urine was obtained per rectum for 6 days postoperatively. The wound continued to heal per primam and there was no urinary leakage. The patient became more and more oedematous and the non-protein nitrogen rose to 109 mgm. % and the creatinine to 9.0 mgm. %. It was decided to open up the wound and insert a T tube in the ureter, if the patient did not put out urine per rectum within the next 24 hours. That night he passed 40 ounces of urine, and from there on his convalescence was uneventful; the oedema entirely disappearing and the non-protein nitrogen returning to 29.5 mgm. %. He was discharged from the hospital on the 20th postoperative day.

Three days later the patient was readmitted to the hospital in coma, with a marked acidosis. His wife stated that he had been having 19 to 20 bowel movements per day since discharge from the hospital. On admission his CO₂ combining power was 18.7 vol. %. His blood sugar was 97 mgm. % and the chlorides were 428 mgm. %. The non-protein nitrogen was 46.0 mgm. %. The most interesting feature however, was that he had also been losing potassium, the blood level being down from a normal of 18.20 to 13.9 mgm. %. He was given 1/6 molar sodium lactate intravenously and potassium chloride and sodium bicarbonate by mouth. Within 48 hours his blood chemistry had returned to

normal. The diarrhoea however continued. A detailed electrolyte study was made by the metabolism department and he was found to require 200 grains of sodium bicarbonate daily to maintain a normal acid-base equilibrium.

During the next 4 months the patient exhibited a very bizarre picture, a profuse diarrhoea, recurrent bouts of temperature but never any tenderness over the right kidney. On two occasions he was readmitted to the hospital for streptomycin therapy, both orally and intramuscularly. A study of the effect of streptomycin on his stool cultures is shown in Fig. 2.

This clearly demonstrates that although the patient had streptomycin-sensitive organisms, streptomycin orally did not appreciably alter the bacteriological count of the stool, because the repeated bowel evacuations were washing out the streptomycin before it had an opportunity to exert its effect. After another prolonged bout of diarrhoea, it was thought possible

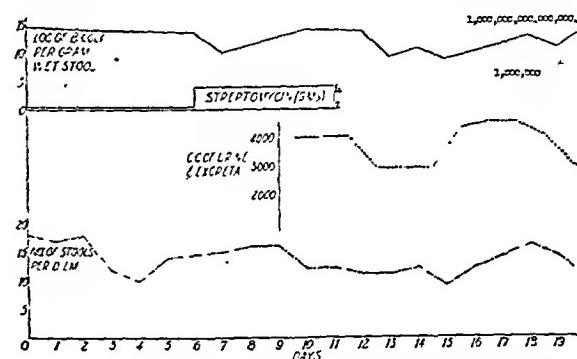


Fig. 2. (Case 1).—Indicating the negligible effect of streptomycin orally on *B. coli* in stool, in the presence of marked diarrhoea (modified after Morton²).

that this might be due to the destruction of some of the normal intestinal flora, by streptomycin, which flora were in fact essential. He was therefore given normal human faeces mixed with a disguising powder in a capsule, three times a day for three days. Following this, there was no change whatsoever in the clinical picture, the diarrhoea continuing unabated 19 to 20 times per diem.

Two weeks later the patient developed intense bladder spasms with the passage of blood clots. This continued, and he was readmitted to the hospital for re-evaluation and probable cystectomy. A cystoscopic examination at this time showed a definite tumour presenting on the left lateral wall of the bladder. It was therefore decided to do a cystectomy. Using Wishard's² quotation "We felt like the Scotch ferryman in a rowboat taking two ministers across the Loch Ness in a storm who said 'The wee one can pray, but the big one can man an oar'".

On March 12, 1948, a total cystectomy was done, the prostate and seminal vesicles being removed *in toto* with the bladder. He had a carcinoma of the bladder (see Fig. 3).

Pathological report, March 17, 1948.

Bladder.—Specimen consists of a well-fixed urinary bladder which includes the prostate, seminal vesicles, and the severed distal ends of the ureters. Externally it is covered by a fibro-fatty tissue, a rubbery hard mass bulges posteriorly from the bladder wall. The bladder has been previously opened on its ventral aspect, revealing a markedly contracted cavity, which is 4 cm. in length in its longest diameter. On the posterior wall there is a round raised, irregularly nodular mass of rubbery, hard tissue, showing a central ulceration. Sections of the bladder reveals a large mass of rubbery, hard white homogeneous tissue, extending through the wall of the bladder from the area described above. The central portion is necrotic and presents a soft

show large red nucleoli. Mitotic figures are common. The prostate is not involved by tumour.

Anatomical summary.—Carcinoma solidum, urinary bladder.

His postoperative course was entirely uneventful. But now, the most interesting feature of the case developed. It was presumed that the cause of the diarrhoea was that the ureteral transplant was so situated as to be giving the patient a continuous high colonic irrigation. When the bladder, prostate and seminal vesicles were removed, the bowel evacuations dropped down to 6 or 7 a day, and have remained there ever since. The patient however still required sodium bicarbonate to maintain a normal CO_2 combining power. He was discharged from the hospital on the twenty-first postoperative day.

At the time of discharge his creatinine was 1.3 mgm. %; non-protein nitrogen 43.1 mgm. %; chlorides 337 mgm. %; CO_2 capacity 71.0 vol. %; total proteins 7.10 gm. %; albumen 4.42 gm. %; globulin 2.77 gm. %; serum sodium 325 mgm. %; serum potassium 17.26 mgm. %; serum calcium 10.8 mgm. %.

CASE 2

L.T., aged 52 years. This patient was admitted to Queen Mary Veterans' Hospital December 6, 1947. His illness began 7 years ago when in 1941 he was investigated at another hospital for frequency and haematuria. No special treatment was given. When overseas, he was discharged back to Canada in 1943 because of a recurrence of the symptoms. In April 1946, he was admitted to Q.M.V.II. for investigation. At that time he was complaining of urinary frequency every 20 minutes to 2 hours during the day time, and four times at night; burning at termination of urination; pain in the left side while working; loss of 15 pounds weight, and terminal haematuria. An intravenous pyelogram done April 25, 1946, showed poor excretion but nothing diagnostic. Urine cultures showed a micrococcus and diphtheroids. A diagnosis of prostatic hypertrophy and prostatitis was made and on May 3rd, the patient was discharged.

He was readmitted to Q.M.V.II. December 19, 1946, because of persistence of frequency and haematuria. He now had a day frequency of 20 to 30 times and a night frequency of 5 to 6 times. He also had some tenesmus and dysuria. Acid and alkaline serum phosphatase were 0.2 and 4.4 units respectively. Many urinalyses repeatedly showed red blood cells and white blood cells and a marked albuminuria up to 130 gm. %. On January 7, 1947, a transurethral resection was done. On the right lateral and left lateral floor of the bladder a papillary growth was seen and subsequent pathological sections revealed evidence of a malignant papilloma. On January 22, suprapubic resection of the bladder was done, and a large papillary growth measuring 15 x 10 x 7 cm. was removed. The bladder was resected and the area fulgurated. Subsequent pathological diagnosis of this specimen also showed papillary carcinoma. Following operation the patient had much difficulty with pain and burning for one month, but his wounds closed satisfactorily. He was given antibiotic therapy using sulfonamides, penicillin and streptomycin. By March 15, except for some frequency and haematuria he was well. On March 28, he was discharged from the hospital.



Fig. 3. (Case 2).—Bladder removed at operation showing carcinoma solidum involving the entire bladder.

friable variegated red, gray and brown appearance. The seminal vesicles and prostate are grossly involved. The tumour extends in the wall of the bladder both inferiorly and posteriorly and superiorly, above to reach the fundus and below to reach the prostate. The remainder of the mucosa is thickened, highly rugose, edematous and cobbled, in places it is covered with fibrinous exudate. The ureteral orifices cannot be defined.

Microscopic examination.—Sections of the bladder show the whole of the wall of the organ to be extensively occupied by a growth of neoplastic epithelium, which completely replaces the mucosa and extends through the muscularis and largely destroys it, to reach the areolar tissue surrounding the bladder. The tumour is necrotic superficially and consists of a pleomorphic, anaplastic solid growth of epithelial cells which are oval to triangular in shape. Their cytoplasm is eosinophilic while the nuclei are large, vesicular, with distorted outlines, many have a hyperchromatic tendency, and

During 1947, the patient spent 3 months in a civilian hospital for suprapubic pain, frequency and dysuria. Seven weeks prior to this admission the patient was in a second civilian hospital for the same complaint. He was then four weeks in the convalescent hospital, where he passed small clots of blood, finally being readmitted to the Ste Anne's Hospital on November 24.

On this present admission he complained of confined suprapubic pain, described as a lot of mice biting inside and also of very slight pain while passing water, and marked frequency every five minutes. He wore a rubber bag during the day. His physical examination at this time revealed the prostate to be quite tender; otherwise, negative. Intravenous pyelograms were essentially normal. Urinalysis at this time showed 80 to 100 white blood cells per high power field and many red blood cells. Urine albumin was 35 mgm. %. On December 17, a bilateral ureteral transplant into the sigmoid colon was performed. The left ureter was transplanted about 20 cm. above the right ureter. For 6 days preoperatively this patient had sulfasuxidine, 1.5 gm. every 4 hours. In addition he had streptomycin, 0.25 gm. orally every 3 hours for 3 days preoperatively and for 2 days postoperatively (a total of 10 gm.). Postoperatively he was also given 12 gm. of streptomycin intramuscularly during a 12 day period. The bacteriological reports of the stool cultures and bowel cultures were as follows: December 12: Moderate growth of usual flora—(preoperatively). No enteric pathogens. December 17: Swab from bowel at operation: Very light growth of usual flora. December 20: Rectal tube drainage: Heavy growth of pseudomonas. Moderate growth of *E. coli* and usual flora.

His postoperative course was quite stormy and he never fully recovered. He ran a continuous fever and an elevated white count up to 17,000. The non-protein nitrogen gradually rose to 96 mgm. %. Subsequent intravenous pyelograms on January 19, revealed the concentration of the dye to be very subnormal. There was a moderate dilatation of the minor calyces but no gross dilatation of the pelvis. There was a small amount of dye present in both kidneys at 2 hours but none at 3 hours. He developed a marked jaundice. The Vandenberg was direct, negative in one minute. Bilirubin 1.7 mgm. %. No satisfactory explanation of this jaundice was found, and it subsequently cleared up. The abdominal incision was now completely healed. He continued to run a septic course in spite of extensive antibiotic therapy, gradually going down-hill and expiring January 24.

At autopsy, the findings were:

Right kidney weighs about 350 gr., measures 12.5 x 6 x 3 cm. The perirenal capsules strip easily to reveal a very pale granular surface. The organ has a "boiled" appearance, looks swollen, is soft and friable in consistency. Scattered over the surface are multiple small 0.3 cm. nodular cortical abscesses. On section the whole parenchyma is creamy-white in colour except for a few of the pyramids which are dark red in colour. The cortex is of uniform thickness throughout, measuring about 0.8 cm. in diameter. The medulla also is of normal size. Scattered throughout are small areas of petechial hemorrhage and small abscess cavities similar to that described above. The pelvis and calyces appear slightly dilated. The lumen is filled with thick creamy pus.

Left kidney weighs 300 gm., and measures 12 x 6 x 2.5 cm. The capsule and perirenal fat strips easily. Several large areas of hemorrhagic extravasations of blood measuring about 3 cm. in diameter are seen in the region of the left suprarenal gland and also on the external surface of the kidney. The external surface of the kidney is also of creamy-pale colour similar to the right, but no cortical abscesses are seen. This kidney is more firm and is less friable in consistency than the right kidney. It does not appear as swollen. The cut surface has the same general appearance as the right kidney, but no abscess cavities are seen. However, projecting from the lumen of the pelvis, a small rubber

catheter is seen. This catheter extends down the ureter to within 4 cm. of the ureteral orifice.

Ureters, bladder and prostate.—The right ureter is dilated especially at its distal end where its lumen measures 1.5 cm. in diameter and is filled with the same creamy pus as seen in the pelvis. The distal end of the ureter has been amputated 4 cm. from the bladder and the proximal end has been transplanted into the lower sigmoid about 18 cm. from the rectum. The intrasigmoid stump measures 1 cm. in length and is well epithelialized. The lumen is easily patent to a 0.2 cm. probe. There is some ulceration of the mucosa of the sigmoid at the base of the stump, otherwise no inflammatory reaction is seen. No evidence of leakage is present.

The left ureter has also been transplanted into the sigmoid, and is 20 cm. proximal to the right ureter.

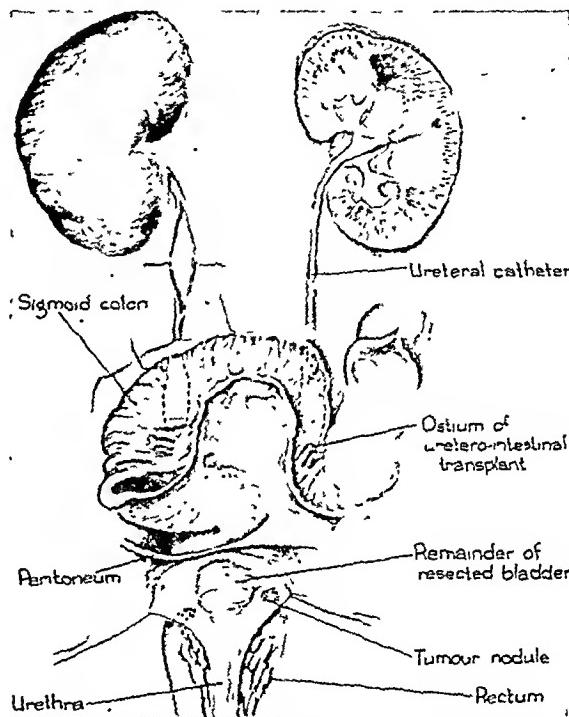


Fig. 4. (Case 2).—Autopsy specimen showing catheter *in situ* in left ureter. Note hydroureter on each side and the small size of the ureteral orifices in the sigmoid.

The intrasigmoid stump also measures 1 cm. in length and is well epithelialized. The lumen is easily probed with a 0.2 cm. probe, no ulceration is seen about this stump. No evidence of leakage is seen. The proximal portion of the ureter is also dilated to 1 cm. in diameter and filled with thick creamy pus similar to that seen in the pelvis of this kidney. The rubber catheter previously mentioned extends to within 4 cm. of the ureteral orifice. The catheter measures about 0.2 cm. in diameter and would not be able to pass through the orifice. In both instances the sigmoid at the site of the transplant has been sutured to the posterior peritoneum. No inflammatory reaction is seen.

The bladder was opened anteriorly. It is small and the lumen measures about 15 c.c. in volume. The wall is thickened by what appears to be fibrous tissue. On the mucosal surface there is a red papillary nodule measuring about 2 cm. in diameter and 0.3 cm. in height on the anterior aspect of the fundus. Also scattered throughout the fundal mucosa are a few red flecks similar to the tissue seen in this papillary formation. No large area of tumour formation is seen. The ureteral

anteriorly and along the medial aspect of the upper arm. There was also a circumscribed, exquisitely tender area in the left infraspinatus muscle, pressure on which induced pain perceived in the shoulder and anterior deltoid regions.

These trigger areas were infiltrated with a 0.5% solution of procaine hydrochloride (total amount 80 mgm.) in physiologic saline. The distribution of referred pain induced by insertion of the needle into the trigger area in each instance corresponded with the spread of pain induced by pressure. The chief sites of infiltration and their respective pain reference zones are shown in Fig. 1. This treatment afforded marked, but not 100% relief of pain.

In January, 1946, the patient accepted another job which involved lifting heavy boxes on to a shelf in a warehouse. Within two or three weeks, he began again to have sharp pain in the left pectoral region. This time, the pain appeared almost immediately after lifting these boxes. Sometimes the pain subsided spontaneously within a few minutes, and sometimes it persisted as a dull ache for hours. There was no nocturnal pain. The patient was not able to come to New York until May, 1946, about 3 months after the recurrence of severe pain. At this time an exercise tolerance test (Master two-step technique) was negative. Results of routine laboratory examinations were also normal. On this occasion the patient was able to delineate two separate zones of spontaneous pain (Fig. 2), which

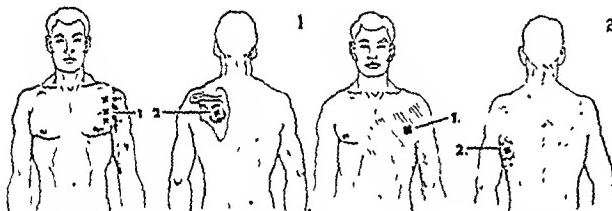


Fig. 1. (Case 1).—Pain reference patterns from trigger areas (x) in (1) pectoralis major and minor muscles (stippled), and (2) infraspinatus muscle (cross hatched), as noted at first treatment (November 22, 1945). Fig. 2. (Case 1).—Pain reference patterns from trigger areas (x) in (1) pectoralis minor muscle (cross hatched), and (2) latissimus dorsi muscle (stippled), as noted at second treatment (May 14, 1946).

appeared independently of each other. One paralleled the lower border of the left pectoralis major muscle and extended from the front of the left shoulder to the lower part of the sternum and slightly across the sternum to the right side of the chest; the other involved the lower part of the axilla and the underarm as far as the elbow. Infiltration of an exquisitely tender trigger area, probably located in the pectoralis minor muscle close to its origin from the fourth rib, set off an intense spread of pain, the distribution of which matched closely the spontaneous area of chest pain previously described by the patient. Infiltration of another trigger area located low in the latissimus dorsi muscle induced a reference of pain which reproduced almost exactly the second zone of spontaneous pain in the axilla and underarm. At this time, infiltration of the slightly tender infraspinatus muscle did not set off a clear reference of pain, as it had previously at the first treatment. This finding was in harmony with the patient's statement that shoulder pain no longer troubled him. As on the first occasion, a 0.5% solution of procaine hydrochloride in physiologic saline (total amount 120 mgm.) was used for infiltration. This treatment resulted at once in complete relief of pain.

Follow-up.—There had been no recurrence of pain when the patient was last seen on November 28, 1947. During this period of about 2 years the patient worked continuously as a bookkeeper.

Comment.—This case presents a clear picture of somatic muscle pain which superficially resembled angina of effort. However, the young age and normal cardiovascular findings militated against a diagnosis of pain due to coronary artery insufficiency. The diagnosis was obscure at first because the onset of pain was gradual and lacked a clear relation to voluntary muscle effort. But as the syndrome progressed, it became evident that pain was induced by work of certain skeletal muscles. The relation of pain to body movement in the pectoralis minor syndrome has been emphasized.²¹

CASE 2

M.B., a 68-year old, white woman, was first seen on March 4, 1947, because of substernal oppression with radiation to the neck on effort. The syndrome was of about one year's duration. The pain appeared on walking if she was tired, or on standing for any length of time. On the other hand, when she "felt well," she could sometimes walk long distances, even miles, without pain. It also often occurred on exposure to cold air and on excitement. Following effort, the pain disappeared promptly on resting. There was no nocturnal pain. She complained of frequent palpitation. For several years previously she had had minor episodes of substernal discomfort, but the severity and frequency of these attacks had increased suddenly about a year previously. Shortly after this exacerbation of pain, she was examined by a "heart specialist" who told her that her electrocardiogram was abnormal and that she must expect to have pain for the rest of her life. There never had been any dyspnoea or signs of congestive heart failure.

Pain had also been present in both hip regions for several years. She had taken a series of "baths" at a spa four years previously on account of this complaint. In the last year, pain in the left hip, like that in the chest, had become much worse, and abduction of the left thigh had become quite limited so that she had difficulty in pulling a stocking over the left foot in the usual manner.

There was a history of malnutrition during the war years and until the summer of 1946, while the patient was living in Germany; she had lost about 30 pounds in weight. It was during this time that the substernal pain became a problem. Although the weight loss had been completely regained in the past year and the blood count was normal, the pain had not lessened.

General physical examination was negative except for absence of vibration sense in the toes and reduced ankle jerks. The heart was not enlarged. The blood pressure at the first visit was 120/90; readings at subsequent visits were 115/80 and 100/78. Special examination of the skeletal muscles revealed marked tenderness over the upper part of the sternum and in the right and left parasternal regions for the upper two-thirds of the sternum (Fig. 3); tenderness of the sternal heads of the sternomastoid muscles; marked tenderness of the left adductor longus muscle with limited abduction at the left hip joint. Laboratory examinations were negative except for a basal metabolic rate of minus 16% and frequent premature auricular contractions in the electrocardiogram; the configuration and time relations of the electrocardiographic complexes were otherwise normal.

At the first visit on March 4, the sternal and parasternal regions of the chest were lightly sprayed with ethyl chloride (Fig. 3), according to the interrupted technique previously described.^{5, 21} Immediately after spraying, tenderness to pressure in this area had disappeared. After this treatment there was no further

chest pain during the subsequent 3 months in which she remained in close touch with us. At the next visit 3 days later, the chest was again sprayed with ethyl chloride although there was no complaint of pain. At the third visit, 4 days later, the patient described an intermittent "choking sensation", or constriction of the throat, similar to that which used to accompany the episodes of substernal pain. The sternal attachments of the sternomastoid muscles were found to be very tender to pressure, and the front and sides of the neck were sprayed with ethyl chloride at this time. Following this treatment the disagreeable sensation in the throat did not recur. On this date a report of the basal metabolism test was received and appropriate doses of thyroid were prescribed, together with vitamin supplements (B complex, tocopherols and ascorbic acid).

Follow-up.—About 8 months later, on January 23, 1948, the patient returned for examination and stated that there had been no recurrence of chest pain. The electrocardiogram was unchanged; frequent auricular premature contractions were evident. She had soon "run out" of the vitamins, and had taken no medication.

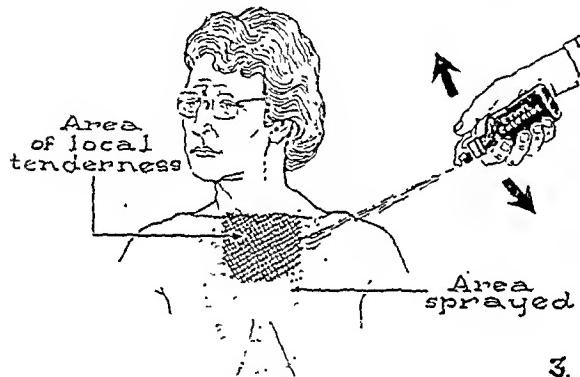


Fig. 3. (Case 2).—Sternal and parasternal areas of local tenderness are cross-hatched, and region of chest sprayed with ethyl chloride is stippled. Note acute angle of stream with skin, sweeping motion of hand and distance bottle is held from chest (12 to 18 inches).

Comment.—This case differs from the previous one in that the pain syndrome resembled true effort angina rather than "pseudo-angina"; pain was substernal and was brought on by walking, cold and excitement and never by movement of any particular part of the body. Complete relief in this case was secured by ethyl chloride spray rather than by local procaine infiltration.

As we have indicated,⁵ a striking response to local block therapy can not be used as a basis for deciding whether pain is of visceral or somatic etiology, and often a definite conclusion regarding its source cannot be reached. We believe, however, that in this patient the evidence points toward a somatic, rather than a cardiac origin of chest pain. In the first place, evidence of coronary artery disease was lacking in the electrocardiogram, since the only abnormality was the presence of auricular premature contractions; secondly, pain elsewhere in the body became worse at the same time that chest pain

became troublesome; this association of muscular spasm in the lower extremity suggested that some general factor might underlie both pain syndromes; thirdly, the restriction of activity due to substernal pain varied tremendously at different times; when the patient was tired, walking only a few blocks induced pain, but when rested she could walk for miles without pain. In our experience this enormous variation in disability over short periods of time, even from day to day, is characteristic of painful skeletal muscle disorders. Although such variability is also noted in a certain number of cases diagnosed as angina pectoris, it is quite possible that in this latter group there exists a large somatic component of the cardiac pain.

One of the well-known hazards of administering thyroid hormone to patients with coronary sclerosis is the danger of inducing or aggravating angina pectoris.²² Therefore, in this case which clinically resembled effort angina, one might well question the wisdom of giving thyroid with the object of raising the basal metabolic rate above its level of minus 16%. On the other hand, our experience with a large group of subjects with chronic or recurrent muscular pain in different parts of the body indicates that a large proportion of them have low basal metabolic rates, and that under these circumstances it is extremely difficult to free them from pain by any form of therapy unless sufficient thyroid is given to bring the metabolic rate up to normal (above minus 5%).

CASE 3

H.H., a 71-year old, white male, was hospitalized on October 24, 1941, because of pain in the precordium and shoulder of 4 weeks' duration. He had been well until 4 weeks prior to admission when, while walking in the park, he suddenly experienced a severe pain in the left chest with intense radiation to the left shoulder and arm as far as the elbow. The onset was accompanied by cough and general weakness. He sat down for a while on a park bench and soon felt somewhat better. However, the precordial and arm pain continued without remission. It was aggravated by deep breathing and by almost any movement of the body. The patient said that he favoured "the left arm" and preferred to hold it tight against the chest.

On admission, physical examination revealed a thin elderly man who appeared sick, anxious and in pain. There was no dyspnoea, orthopnoea, or cyanosis. The lungs were normal. The heart was not enlarged. There were no thrills or murmurs. The pulse and ventricular rates were 84 per minute, and the rhythm was regular. The blood pressure was 100/84. There was no enlargement of the liver or spleen, and no oedema. According to subsequent questioning, limited motion was present at the left shoulder joint, but was not noted in the record. The tentative diagnosis on admission to the hospital was acute myocardial infarction. This was based chiefly on the mode of onset, and was not confirmed by the subsequent course or laboratory findings.

There was no fever during hospitalization. The blood sedimentation rate was 10 mm., and 6 mm. at the end of an hour on the first and third hospital days, respectively. The white blood count was 9,400 with 58% neutrophiles. X-ray of the chest was negative. The electrocardiogram was normal. The venous pressure was 10 cm. of water. The circulation times were normal; arm to tongue (calcium gluconate) 17 sec., and arm to lung (ether) 5 sec. X-ray of the dorsal spine showed slight productive changes along the margins of the thoracic and lumbar vertebrae. X-ray of the right shoulder showed a small calcific deposit in the region of the subacromial bursa.

When we first saw the patient on October 31, seven days after admission, he was brought to our treatment room on a stretcher. Re-evaluation of the history led us to question the diagnosis of an acute cardiac disorder because of the unremitting character of the pain and the marked degree of limitation of motion at the shoulder. Furthermore, corroborative evidence of a recent myocardial infarction was lacking in the electrocardiogram and other laboratory tests. In addition, there had been an episode of similar, but less severe pain and restricted motion in the right shoulder, which began ten days after the onset on the left side and which disappeared in a few days.

At this time, motion at the left shoulder joint (Fig. 4) was almost totally limited. Abduction was restricted to 26 degrees. The range on extension was practically zero; by bending the elbow, the hand could be brought as high as the face only. Internal and external rotation at the shoulder were likewise completely limited, and attempts at making these movements were excruciatingly painful. The range of extension and flexion of the elbow, and of supination and pronation were normal, but all motions of the arm and also of the neck and trunk were extremely guarded.



Fig. 4. (Case 3).—Photographs showing maximum range of motion at left shoulder joint in relation to treatment by local block of trigger areas in left posterior scapular and interscapular muscles. Note marked limitation just before treatment and normal motion shortly afterward. Photographs a and b were taken before infiltration, and c was taken 20 minutes after infiltration.

Palpation of the muscles of the left shoulder girdle disclosed a trigger area in the left infraspinatus muscle, pressure on which induced an intense accentuation of the spontaneous pain in the shoulder and arm (Fig. 5). Another trigger area from which a wide reference of pain could be induced by pressure was found at a point just medial to the scapula at the level of the spine of the scapula. This trigger area was judged to be located in the posterior superior serratus muscle because of its depth as demonstrated by local injection (Fig. 5). There was also generalized, low-grade tenderness to pressure of all of the muscles of the shoulder girdle, and also of the cervical and upper thoracic spinal muscles on the left side. There was a point of exquisite tenderness directly over the spinous process of the seventh cervical vertebra. There were no abnormal neurologic findings.

A total of 5 c.c. of a 1% aqueous solution of procaine hydrochloride was used for infiltration of these

two outstanding trigger areas. The injections were accompanied by an intense spread of pain to the chest, shoulder, arm and even to the neck. This was followed at once by a feeling of profound weakness and heaviness of the arm; for a few moments the patient could raise the arm with a quick movement, but a sustained effort could not be maintained. At this time it was noted that the widespread generalized tenderness of the muscles had entirely disappeared, as well as the tenderness over the spinous process of the seventh cervical vertebra.

Within 20 minutes after the start of the treatment, another photograph was taken (Fig. 4), which shows that the range of motion had been restored to normal. The patient could swing his arm rapidly in a full circle without pain. He helped wheel his stretcher back to his room and greeted the resident physician by lifting him up in his arms and carrying him around the room. There was no further treatment, and 3 days later (November 3), the patient was discharged to his home free from pain.

Follow-up.—The patient has now been observed for 6 years. There has been no recurrence of pain in the chest or upper extremity. On March 12, 1947, at the age of 72 years, the patient was last re-examined. The only change was that a low T₂ had appeared in the electrocardiogram.

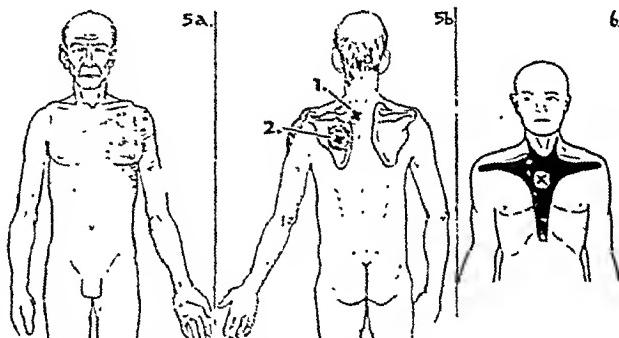


Fig. 5. (Case 3).—Pain reference patterns from trigger areas (x) in (1) posterior superior serratus muscle (stippled), and (2) infraspinatus muscle (cross-hatched), as noted at treatment on October 31, 1941. Fig. 6.—Composite pain reference pattern of sternalis muscle from trigger areas located at (x).

Comment.—In this case the resemblance of the clinical picture at the onset to acute coronary thrombosis is striking. This diagnosis was suggested by the fact that the patient was in the coronary disease age group, by the suddenness of onset of intense precordial pain with ulnar radiation, and by the lack of any relation to special use or obvious strain of the voluntary muscles. It is obvious that when a patient who is 65 years of age presents himself with such a history, the burden of proof is on the physician to exclude acute myocardial infarction. Nevertheless, this case illustrates the need for consideration of somatic causes of the symptomatology even in the presence of a presumptive diagnosis of acute coronary thrombosis. The clue to the etiology, as subsequently demonstrated, lay in the fact that extreme limitation of motion at the shoulder joint was present from the onset. In our experience, the "frozen shoulder syndrome" has occurred as a late sequel

* For reasons stated,²⁵ we now prefer a lower concentration of procaine hydrochloride for infiltration, namely, 0.25 to 0.5%.

to myocardial infarction and not coincidental with the development of this cardiac lesion. This lag in the appearance of post-infarction shoulder pain has also been noted in a current review.²⁷

DISCUSSION

Our recent studies^{4, 5} focus attention on the fact that pain clearly of cardiac origin can be abolished, either temporarily or permanently, by measures which block the somatic trigger areas concerned in the reference of pain from the heart. The present report deals with the differential diagnosis and treatment of pain syndromes of the chest which are primarily *somatic* in origin, but which resemble effort angina or acute myocardial infarction.

In the first place, our observations are in conflict with the frequently encountered view^{8, 11, 18, 20} that when pain on effort (walking) is *substernal*, it is necessarily due to coronary artery disease, whereas when it is located in the *precordium*, it may originate from either cardiac or somatic causes. In the second place, we have found that certain other criteria which are often accepted as pointing toward a cardiac etiology of chest pain, can no longer be regarded as reliable. The intensity and quality, as well as the distribution, of so-called cardiac pain can be reproduced in every detail by the referred pain momentarily induced by stimulation of trigger areas in the chest muscles.^{4, 5, 6, 16} Furthermore, we can no longer depend with certainty on transient electrocardiographic changes if the electrocardiogram was taken during an attack of pain, as it often is, since extra-cardiac pain, induced for example by work-ischaemia of the forearm muscles, may temporarily produce abnormalities of the T-waves compatible with a diagnosis of coronary insufficiency.²⁸ Even relief by nitrites does not necessarily signify that one is dealing with coronary artery pain, because a placebo sometimes appears to be equally effective in effort angina,²⁹ and because nitrites have been found occasionally to relieve skeletal muscle pain.^{9, 11}

It is sometimes implied²¹ that the absence of pain on special movement of the trunk or arms excludes a somatic etiology of chest pain, but this conclusion is not valid since trigger areas which include the chest in their pain reference patterns, may develop in certain locations without producing any demonstrable restriction of motion. The rudimentary *sternalis* muscle on the face of the sternum is an illus-

tration of this fact: the composite reference pattern of this muscle as observed in a group of patients is shown in Fig. 6. It should be emphasized that conversely, the presence of limitation of motion does not rule out the diagnosis of a post-cardiac pain syndrome.

What diagnostic criteria, then, remain to distinguish somatic from cardiac pain syndromes of the chest? In acute episodes of pain suggestive of myocardial infarction, the presence or absence of signs of tissue necrosis and circulatory collapse are of the utmost importance in weighting the diagnosis in one direction or the other. The absence of trigger areas would seemingly rule out the skeletal muscles as a cause of pain, unless of course, the trigger areas happened to be located in the retrosternal striated muscles of the chest wall where they would not be accessible to palpation. That the pain syndrome is primarily somatic in origin is often suggested by a "rheumatic tendency" of the patient, or the finding of painful motion elsewhere in the body attributable to trigger areas in appropriate muscles. In chronic effort syndromes, the most valuable positive sign of a somatic disorder is an enormous variability in the exercise limit, or capacity for effort without pain, over short periods of time, as noted in Case 2. In our experience, such variability is rarely seen in coronary artery disease; in true effort angina, just as in intermittent claudication, pain appears after walking approximately the same distance, within narrow limits, from day to day. On the other hand, if the distance which the patient can walk fluctuates widely, it is likely that there is a large somatic component in the etiology of pain.

A pertinent therapeutic problem is the question whether pain in cardiac disease is a protective mechanism, and its removal therefore contraindicated. We have been led to conclude⁵ that pain itself may reflexly diminish the calibre of the coronary arteries and so contribute to further damage of the myocardium.^{1, 30} In addition, when pain is not suppressed, the excessive restriction of activity which may result, often leads to physical and mental deterioration of the patient. In our opinion local block therapy²⁴ is indicated for the relief of chest pain whether the somatic manifestations are believed to be skeletal or visceral in origin, and even when there is so much evi-

denee in support of both etiologies that the primary cause of pain cannot be positively established.

SUMMARY

1. Three case reports demonstrate the striking resemblance which pain syndromes of the chest muscles may bear to effort angina and acute myocardial infarction.

2. Intractable chest pain which originates in the skeletal muscles may be relieved by local block therapy (procaine infiltration or ethyl chloride spray) in a spectacular manner.

3. Relief of pain by these measures does not prove that the cause of pain is primarily somatic, since under suitable conditions cardiac pain may likewise respond to local block of the appropriate somatic structures.

4. Other criteria which differentiate somatic from cardiac etiologies of chest pain are discussed.

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The detection of early malignant lesions of the breast is often impossible for the layman and even difficult for the physician because of the small size of the growth. Three cases are presented to illustrate the need of a careful examination of the axilla of all patients despite negative breast findings. If axillary nodes are found they should be removed for pathologic examination, and if found to be malignant the advisability of a radical breast amputation should be given most serious consideration. Carcinoma of the Breast in the Absence of Clinical Breast Findings. JACKSON, A. S., *Ann. Surg.*, 127: 177, 1948.

THE CARE OF PARAPLEGIC PATIENTS IN GENERAL HOSPITALS

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MUCH of the recent literature on paraplegia deals with the management of the paraplegic patient in specialized centres. However, many patients are not fortunate enough to be admitted to such centres until their convalescence has progressed through the important preliminary stages. Almost all paraplegics receive their first treatment in general hospitals, where the staff has had no opportunity to carry out paraplegic care. The advanced work in paraplegia in Canada is being done at such special centres as Lyndhurst Lodge, Sunnybrook, and Deer Lodge. These units resulted from the combined efforts of D.V.A. and the Canadian Paraplegic Association. Until mid 1947 they dealt mainly with paraplegia incurred during service in the armed forces. As the patients of this type gradually completed their retraining program, more beds became available for civilian use.

Statistics show that, although the initial expenditures of active treatment necessary to restore these patients to self-sufficiency in active society are high, this policy is, over a long term, cheaper than maintaining the patients and their families as public wards. This article arises from the problems encountered during the treatment of six paraplegic patients at the Ottawa Civic Hospital. No conclusions may be drawn from this small series of cases, but the lessons learned, backed by the recorded experience of others, are worthy of attention.

The fundamental of paraplegic care—team-work—should be readily available everywhere. Without teamwork, the most expensive equipment and the best of intentions are ineffectual. This fact should be clearly understood by the patient, nurses, orderlies, dietitians, social service workers, physiotherapists, interns, the urologist, orthopaedist, and general surgeon. A general hospital team's objective is to prepare the patient for transfer to a paraplegic centre, at the earliest possible date, without the development of urinary sepsis, decubitus ulcers or contractures. The team has failed if any of these complications develop. It is for the specialized centre to decide upon the necessity of pro-

cedures such as rhizotomy, and the type of final mobility the patient will attain. Any member of the team who feels that he alone is competent to supervise the patient to complete recovery is merely salving his ego, at the expense of the patient's future.

For the majority of the patients coming to a general hospital, the origin of the paraplegia is traumatic. Shock, soft tissue damage, and fractures should be treated in the usual manner. Paraplegia should be suspected if there is flaccid paralysis with abolition of tendon jerks and plantar responses. The patient may complain of a zone of hyperesthesia, or of tight band-like sensation just above the lesion level.²

Care of the genito-urinary tract.—If the patient suspected of paraplegia has not voided within eight hours after admission, and has a percussable suprapubic mass, a Foley catheter, never larger than 18 French, should be aseptically inserted into the bladder. A larger catheter will not prevent leakage. It will predispose toward sphincter atony and pressure sores of the urethra, which is even less resistant to pressure damage than the tissues over the sacrum and trochanters.

The greatest single advance in paraplegic care is automatic bladder irrigation, first described by Laver² in 1917, and improved by Munro and Hahn.³ The literature^{4, 5, 6} contains descriptions of many variations and improvements of the original model. At the Ottawa Civic Hospital we used a simple, cheap, easily assembled irrigator. Lightweight brown intravenous type rubber tubing, which does not kink easily, is used. The irrigator jar and connecting tubing are autoclaved in packs prior to use. When in use, this equipment should be dismantled, cleaned, and re-autoclaved every seven days. Tidal irrigation is commenced immediately, with the siphon level set at 1 to 2 cm. above the level of the pubis. When necessary, the tidal irrigator may be temporarily disconnected to position the patient for x-rays and operative or manipulative procedures.

Cystometry.—As soon as possible, a cystogram (following the Munro routine outlined below) must be done to estimate the functional capacity of the bladder.

The following routine for cystometry is suggested by Munro.⁷

1. Empty the bladder.
2. Clamp tubing leading to siphon.

3. Release the clamp on lead-in tubing to allow measuring solution, either solution G, solution M (citric acid 32.35 gm., sodium carbonate (anhydrous) 8.84 gm., magnesium oxide 3.84 gm., distilled water q.s. ad 1,000 c.c. autoclave before use, tint with methylene blue) of Suby and Albright,⁸ or 1.5% boracic solution to flow from a calibrated glass container, 50 cm. above bladder level, at the rate of 90 drops per minute (a faster rate provokes an unphysiological bladder response) through the Murphy drip, tidal irrigator and via the Foley catheter into the bladder.

4. After running in each 25 c.c. of fill, clamp the inlet tube and note manometer level.

5. At each change in intravesical pressure, recorded by the fluid level in the glass manometer, note on paper: (a) height of fluid in manometer; (b) amount of fluid that has run into the bladder; (c) the point at which any leakage occurs about the catheter.

6. Continue until 400 c.c. of fluid has been run into the bladder. If there is cause to believe that there will be reflux up the ureters, due to hypertrophy or fibrosis of bladder wall, or if there is a history of cystitis, a smaller amount of fluid (100 to 200 c.c.) must be used.

7. Disconnect the catheter and allow the bladder to empty. Hold the open catheter end at the level of the pubis.

8. When this flow ceases, lower the end of the catheter and measure any residual that siphons out.

The four sets of figures: (a) the amount of fill; (b) the manometer fluid level for each 25 c.c. of additional fill; (c) the manometer fluid level when any bladder contraction occurs; (d) the residual, will give all information necessary for bladder care in a general hospital.

The interpretation of these data is as follows: (1) An emptying contraction occurs when intravesical pressure reaches 50 cm. of water or when there is leakage about the catheter. Classic emptying contractions develop solely in normal or reflex bladders. (2) Minimal capacity of the bladder is the amount of fill that has collected between the first and the second emptying contractions. (3) The curve of basic tonus indicating the irritability of the detrusor muscle is determined over a period of weeks by subtracting the lowest intravesical pressure from the highest, noting the amount of fill and plotting a graph of the two columns of figures on coordinate paper.

Reflex anal contraction resulting from prickling either the glans penis or perineal region denotes a normal anal or bulbocavernosus reflex. This reflex is present only in the absence of spinal shock and when the internal pudic nerve (or pudendal - S-2-3-4) and its spinal cord connections are intact. Presence of this reflex means the external urethral sphincter is under either voluntary control or involuntary reflex control. Absence of the reflex anal contraction, if spinal shock is not present, denotes paresis of the external urethral sphincter.

Cystometry, which includes measurement of residual, must be done at least every three weeks

to determine the stage present, and to follow the patient through each step toward optimum functional activity. Increasing bladder tone, in the absence of infection, should be accompanied by gradually increasing the siphon level. If bladder capacity diminishes, and/or residual increases, the cause must be located and corrected. Urinary tract calculi, cystitis and suprapubic drainage reduce bladder capacity. Hypertrophy or fibrosis of bladder muscle, or pseudomedian bar formation of the internal urethral sphincter cause urinary retention. These conditions must be detected quickly and treated before stasis leads to calculus formation.

A patient confined to bed tends to mobilize calcium, thus increasing urinary calcium content. This, in the presence of genito-urinary tract sepsis, is believed to be a potent factor in stone formation. A paraplegic patient with a temperature elevation of 99 to 100° complaining of generalized, dull, oppressive, abdominal discomfort, which is increased by palpation or percussion of either costo-vertebral angles, should have an immediate KUB x-ray film. Each paraplegic patient should have a KUB film every three months, and an intravenous pyelogram every six months, even if the above indications are absent. Cystoscopy and retrograde pyelography should be done if indicated. This routine detects early asymptomatic calculus formation.

Decubitus ulcers.—The development of decubitus ulcers is an urgent indication for critical re-assessment of the entire routine of paraplegic care. Action must be immediate and aggressive.

In 1936 Lewis⁹ demonstrated that ischaemia of six to twelve hours damages the skin, while continuous ischaemia for twenty-four to forty-eight hours produces necrosis of the skin. In paraplegics who have lost their normal muscular tone and elasticity of the subcutaneous tissue pad, a complete obliteration of the vessels between the skeletal prominences and pressure points occurs. Trauma, soiled bed linen, disuse atrophy of the interposing padding, skin and tissue alterations, due to toxæmia and hypoproteinæmia, are additional factors facilitating embarrassment of local circulation. Each patient's vulnerability to decubitus ulcers is directly proportional to the degree of severity of these conditions. This fact must be explained in understandable terms to the patient, nurses, and orderlies carrying out the daily routine paraplegic care.

The importance of a rigidly adhered-to turning schedule must be constantly re-emphasized. Routine back care must be fastidiously performed twice daily, and whenever the patient becomes soiled. Pressure points in recent paraplegies must be relieved every three hours day and night.

Our first case at the Ottawa Hospital was a traumatic dislocation of the body of the eighth thoracic vertebra and compression fracture of the ninth thoracic vertebra. The patient was immediately placed in a hyperextending, bivalved plaster bed and placed on a q.3h. turning routine. This was not rigidly adhered to, and decubitus ulcers over both patellæ developed. Attempts to treat them with moist penicillin compresses failed. The tissue became macerated, and the areas involved extended. Finally, the sloughing areas were controlled by dry heat, and then covered by a sliding flap graft.

Most workers¹⁰ agree that ointments and wet dressings macerate the skin. If a decubitus ulcer develops, use dry heat. When there is clinical evidence of clean margins, absence of local infection, a clear urinary tract and normal temperature, cover the defect following excision of the edges with a split thickness skin graft or a rotation flap.¹¹ Spontaneously healed ulcers leave easily traumatized scars. Do not apply wet dressings or ointments to paraplegic bedsores, and do not wait for them to heal spontaneously.

Diet.—Routine hospital diet is inadequate for the requirements of most paraplegic patients.¹² The order "high protein, high carbohydrate, high vitamin diet" does not remedy this lack. From the first hospital day, one of the team, preferably a dietitian, must be made solely responsible for the diet. At the earliest possible moment, the patient should be weighed. A chart of the weight, determined every seven days for the first two months and then every 14 days, is the simplest and most accurate means of assessing dietary adequacy. Poer's¹³ statement that 74% of wartime paraplegic patients arriving in the United States following injury received overseas had developed marked emaciation with an average weight loss of 42.5 pounds per person gives one an indication of the extent to which the nutrition of the paraplegic patient can deteriorate.

The diet must prevent or correct hypoproteinæmia. That is, the diet must never allow negative nitrogen balance to exist. Mecray¹⁴ has demonstrated that hypoproteinæmia prolongs the emptying time of the stomach. Barden¹⁵ demonstrated that the same factor impairs small intestine function. With these two findings in mind, one can realize the difficulty with which the hypoproteinæmic patient ingests the required large amounts of food. Some of the objections to bulk, flavour and cost may be overcome by the use of concentrated food sources of protein. Soybean flour, which can be used in pancake and muffin mixes, soups and pastry products, contains 37 to 45% protein.¹⁶ Peanut flour, which can be blended in hominy grits, rolled oats and corn-meal, has 50 to 60% protein.¹⁷ This flour may function as a binder in meat loaves, sausages, and as a base in soup concentrates. Dried yeast, an excellent vitamin source, is approximately 45% protein. This source may be used with syrup, peanut butter, or in baked products such as bread, cookies and doughnuts.¹⁸ Dried gelatin yielding up to 85% protein may be added to hot beverages and soups. Bauman¹⁹ devised a high protein beverage consisting of milk, frozen egg whites and powdered milk (Dryco). One glass (200 c.c.), supplying 20 grams of protein, provided 240 calories.

As the patient's condition becomes stabilized, excessive weight gain may easily occur, but this must be avoided. This development creates an unnecessary handicap in the performance of basic exercises, wheel chair manoeuvres, crutch-walking and brace ambulation. An ideal objective is the maintenance of the patient's weight within ten pounds of his computed basic weight.

Care of the bowels.—Many facts remain to be learned concerning the altered bowel function in paraplegic patients. Best and Taylor²⁰ state that section of the spinal cord above the sacral segments causes relaxation of the colon. This is felt to indicate that constant tone augmentor impulses are received from higher centres. If the pelvic nerves are severed some time after spinal transection, colonic relaxation results. This is believed due to sacral segments acquiring control of colonic tone during the interval following cord transection. This theory suitably accounts for the gradual improvement in colonic

function, usually noted as the patient progresses towards a more active life. Derangement of bowel function is less marked if the cord lesion is not complete. Generalized increase of muscular tone is an important additional factor in the restoration of regular bowel evacuation.

While in a general hospital the patient should receive bland enemata (*i.e.*, milk and molasses, saline or hydrogen peroxide) at a routine time every second day. Prolonged use of more irritating agents will eventually cause a troublesome chronic proctitis. At the Ottawa Civic Hospital, we found pituitrin or prostigmine helpful if given intramuscularly fifteen to thirty minutes preceding enemata administration. Teaching of self-administration of enemata should be done at the specialized paraplegic centre later in the patient's convalescence. Laxatives such as gelucil, petrolagar, agarol, liquid paraffin, or milk of magnesia may be used. The patient, after a trial of each type of agent, should be allowed to adopt the most suitable to his individual use. If regular bowel movements are obtained by this means, enema administration may be discontinued. Faecal impaction in paraplegic patients is the commonest cause of frequent loose bowel movements.

Physiotherapy.—The aim of a physiotherapist in a general hospital is to prevent contractures and muscular deterioration, particularly of the arm and upper trunk musculature. It is the physiotherapist's responsibility to see that a foot board is constantly in place to prevent the pressure of bedding causing foot contractures. As soon as the patient's general condition permits, simple reconditioning exercises should be done under supervision twice daily. Gradually the schedule should be expanded to include rolling from side to side, resistance pulls against weights on pulleys, and trunk lifting by means of overhead bed bars.²¹ The active physiotherapy department at the Ottawa Civic Hospital organized wheel chair and mat classes. However, if the general hospital patient is able to engage in these activities, he is ready for transfer to the paraplegic centre.

Psychological aspect.—The wide variety of mode of onset of paraplegia, the patients' personality factors, their background and their subsequent adjustment allow only generalized statements concerning the psychological aspect of management. The variables must be considered individually in each case. A practical, sympathetic, continued understanding of each

patient's problems will go furthest in aiding his re-adjustment. Psychoanalysis and psychiatric consultations will do little to alter the basic pattern of the adult patient.

The necessity of dependence in some degree upon others is soon apparent to the paraplegic patient. Obviously overindulgent pity and attention quickly evokes an unpleasant reaction in most patients. This attitude is not to the pity, but to the consciously or subconsciously perceived implication of the unfortunate and dependent nature of this patient's predicament.²² Neglect and disregard, on the part of relatives, nurses, orderlies, interns and staff doctors, cause even more intense bitterness.

In most general hospitals, nurses and often inept orderlies are largely responsible for the care of paraplegic patients. In their normal daily routine, the nurses, unless specially detailed, are frequently unable to devote the time required for the individual paraplegic care, without neglecting other patients. At the Ottawa Civic Hospital, we had one patient who, when turned, required the assistance of two (and frequently three) nurses and an orderly or intern. If this personnel was unavailable, she was not turned q.3 h. The appointment of a regular team and attaching a time schedule to the patient's bed overcame this difficulty.

To the patient who but a short time previously had been free and active, claustrophobia is not an idle or technical word as he lies confined to bed. Frequently, daily visitors stand grouped around the patient's bed, peering down. If relatives or doctors are visiting paraplegic patients, they should sit down at a convenient distance from the bed, at a level equal with or lower than the patient, in a position where the patient can easily see them. This assists the patient in maintaining a freer, more natural attitude.

Everyone's daily experiences of varied degrees of frustration are intensified in the paraplegic patient. Having to wait for the nurse or orderly to bring a bed-pan, or to assist him on to the toilet, finding the meal cold or unpalatable, being refused something he formerly could get himself, inaccessibility of facilities to see a motion picture, inability to engage in a former sport or hobby, all can arouse impotent anger and deep despair. The patient may interpret any of the above, or similar situations, as indifference or neglect. His reaction may be one of temper tantrums, sulking, refusing to take

medicine, or offering multiple excuses for not engaging in his daily routine. This adds to any difficulty in maintaining the extremely necessary high degree of motivation. The difficulties are more acute in a general hospital, where the paraplegic patient is in close association with other patients who are making relatively rapid progress toward complete recovery and discharge. At a paraplegic centre, where all general hospital paraplegic patients should eventually be sent, the patient is in close daily association with others similarly afflicted who are combating the same problems and situations and reaching an adequate solution.

In male patients, the loss of sexual function (ejaculation) should be discussed and explained. At the present time, clinical research being done in England and the United States may change our present concepts of this depressing situation.

"Into the fertile field of the indefinite future, these patients project their hopes of eventual complete recovery".²² Caution is imperative in discussing prognosis. Over-optimism or over-pessimism on the part of attendants can swing the patient from the heights of elation to the depths of despair. In a traumatic case, where the cord is definitely known by surgical exploration to be irreparably damaged, the prognosis can be given and should be discussed with the patient. A positive statement, unless grounded on fact, is dangerous.

More difficult problems are those cases of disseminated sclerosis passing through periods of exacerbations and remissions in their slow down-hill course. In all cases, as long as improvement of function and physical ability improves, the repeatedly reassured patient must adhere to a definite pre-planned daily routine of exercise, physiotherapy and self care.

Restoration to society.—Except when insurmountable major physical defects exist, the treatment of the patient has failed, no matter what degree of physical fitness and accomplishment is attained, unless he is discharged to resume a useful, active part in community life. During convalescence, the patient must be given a definite objective for which to plan actively and constructively. Otherwise, eventual physical and mental deterioration is inevitable. In all cases, the entire mode of living will be altered radically. Mindful of these facts, a responsible member of the team should seek to interest such organizations in the patient's own community as the Kiwanis, Rotary, Knights of Columbus, and

similar groups, in each patient's problems connected with return to community life. It is short-sighted to wait until the patient has reached the zenith of his recovery before asking such organizations to be interested in assisting the patient's social re-establishment. The club members' interest and activity will be greater if a delegated club member follows the patient's progress from a state of relative helplessness to his return to active society. These clubs will more eagerly survey job possibilities, and assist in furnishing such necessary extras as braces and wheel chairs.* The assistance of such organizations speeded the return to community life of several of the group of paraplegic patients treated at the Ottawa Civic Hospital.

SUMMARY

1. A policy for general hospital care of paraplegic patients is outlined.
2. The complexity and multiple details of the problem, and necessity for constant co-operation are stressed.

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* The Everest-Jennings wheel-chair, with or without detachable side-arms, is the most satisfactory type available. It weighs approximately 32 pounds and can be collapsed to a width of 10 inches. Information concerning this equipment may be obtained from the Everest-Jennings Company, Los Angeles, California, or the Canadian Paraplegic Association, Toronto.

Appearance of whooping cough in a locality should be the cause of much more general concern than is usually expressed. For whooping cough is not just an unpleasant experience in a child's life—it is a real menace to health, one of the most serious of the contagious diseases. A child should be immunized against whooping cough at the earliest opportunity. This will provide complete protection for from seven to nine out of every ten, and the remainder will suffer milder and shorter attacks.

THE SURGICAL TREATMENT OF INTRAVENOUS CLOTTING*

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THIS subject is still a very controversial one, and I can only place on record my impressions of the matter. These impressions are, however, a result of the evaluation of the observations of others.

Before anyone can intelligently treat any condition, one must have some reasonably clear-cut idea of what that condition is, and what the factors are which bring it about.

ETIOLOGY OF INTRAVENOUS CLOTTING

Predisposing factors.—(a) Cardiovascular disease; (b) advancing age; (c) foci of infection; (d) obesity; (e) debility; (f) anemia; (g) varicose veins; (h) seasonal variations; (i) geographic factors and a number of others.

Precipitating factors.—(a) Trauma, with vascular changes and circulatory retardation; (b) absorption of noxious substances (polypeptides) from injured cells resulting in changes in the blood; (c) infection (gross); (d) inertia and posture leading to venous stasis.

Cardiovascular disease.—Some authors¹ emphasize the statement that the incidence of post-operative thrombosis is dependent more upon the heart and the state of the general circulation than it is upon the disease process or the operation. Others² have found that in 90% of their reported 91 cases of fatal pulmonary embolism there was pre-existing cardiovascular disease at the time of the fatal seizure.

Age.—According to a number of authorities the incidence of thrombosis is greater in the later decades of life. The vast majority of the reported cases are between the ages of 40 and 60 years. It is comparatively rare under 40 years of age.

Seasonal influence.—Some of the older authors^{3, 4, 5} believe that the incidence is higher in the spring and fall, and attribute this to the prevalence, at these seasons, of the "grippal" infections.

Geographic factors.—This is emphasized by some authors,⁶ who report that the average incidence of thrombosis is 0.75 per 100,000 of population in northern states, whereas it is

* From the Department of Surgery, the Montreal General Hospital.

only 0.41 in southern climates. One explanation offered for this phenomenon is a hyper-excitability of the circulatory system as a result of repeated vasospasms due to cold.

Obesity.—All surgeons tend to regard the obese patient as a poor surgical risk, and whether or not this is due to a fatty infiltration of the heart muscle, resulting in poor circulation, or merely to lethargy and inertia, it has been reported by Barker and his co-workers that in a series of 3,680 patients upon whom intestinal operations were done, thromboembolism occurred in 3.2% of those who weighed under 200 pounds, and in 7.1% of those heavier than this.

Debility.—Here, of course, there is a variety of factors grouped under one heading: circulation is poor, there is often disease of the vessels, the patient is lethargic and moves little, and there may also be changes in the blood, leading to an increased likelihood of clotting.

Varicose veins.—Stasis in this condition, naturally favours clotting. However, without labouring these factors further, it will be noted that though a multiplicity of pre-disposing and exciting causes is adduced by an impressive battery of authors, and indeed many more could be cited, all these causes may be essentially narrowed down to two:

- (1) *Deficiency of circulation* due either to cardiac insufficiency, venous stasis or vasospasm.
- (2) *Changes in the blood:* (a) changes in the calcium-potassium ratio; (b) changes in the albumin-globulin ratio with increased globulin; (c) Increase in both the number and agglutinability of the thrombocytes.

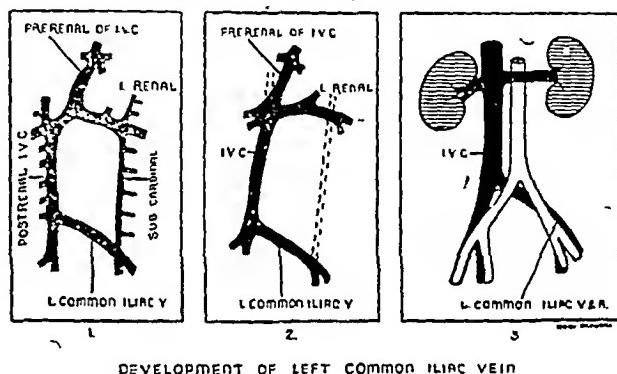
The increase in the number of thrombocytes is a normal postoperative reaction of the body. It has been demonstrated by clinical studies that there is a decrease for approximately the first five days: when they have presumably been "used up" in overcoming the operative interference; and then a massive increase between the eighth to eleventh days.

The increase in agglutinability is thought to be due to changes in the electrical charges in the formed elements and a loss of normal repulsion. This, in turn, is said to be a result of the changed albumin-globulin ratio, and this change itself is probably due to the absorption of polypeptides released by tissue cells damaged by the operative procedure. The more

trauma to tissue, the more likelihood of clotting (a plea for sharp dissection as opposed to blunt). The serum peptidase may be used as a guide to the amount of aseptic cell destruction which has gone on.

ANATOMICAL CONSIDERATIONS

It is common knowledge that intravenous clotting occurs much more commonly in the left leg. The figures are roughly 65% left—25% right—10% both. The reason is, of course, mainly anatomical. In the two-month embryo there are two caudal veins which fuse, with an anastomotic vein below (Fig. 1). That portion of the left caudal vein between the fusion and the anastomosis later disappears (Fig. 2). Hence the ultimate left common iliac vein is the smaller of the two and enters into the inferior vena cava at a much more acute angle than does the right.



DEVELOPMENT OF LEFT COMMON ILIAC VEIN

In addition, the left vein is crossed by the right common iliac artery, and is also liable to be subjected to pressure by a loaded sigmoid or rectum (Fig. 3).

THE PATHOLOGY OF INTRAVENOUS THROMBOSIS

When one comes to study the pathological processes associated with this phenomenon, one is immediately struck by the fact that there are two separate and distinct processes which may occur. One of these is mainly associated with acute inflammatory changes about and in the vein wall and in this the clotting is of a very secondary nature; the other is that in which there is primarily clotting of blood in the lumen, and with very little involvement of the vein wall.

These two processes have been distinguished by the term thrombo-phlebitis for the former, and phlebo-thrombosis for the latter.

Thrombo-phlebitis.—This occurs as a result of eventual injury to the endothelium of the vessel because of trauma (mechanical or chemi-

cal) or bacterial invasion. The invasion takes place usually by way of the peri-venous lymphatics, and only rarely, as in cases of pyæmia, occurs primarily within the lumen; and is usually unaccompanied by any particular changes in the blood constituents.

In consequence of this, since the clotting is secondary to acute inflammatory changes in the vessel wall, there is the laying-down of a white, tough, thrombus due to the adherence of leucocytes and fibrin, which is relatively firmly adherent to the vessel wall, and hence, unless in the rare event of suppuration, unlikely to embolize.

Because of the acute inflammatory process, however, there is associated arterial and arteriolar spasm, with pallor and œdema as a result. Ochsner and DeBakey have shown that the pain in acute thrombo-phlebitis is not due to the inflammation and irritation of the vein proper in the main, but to ischaemia induced by severe homolateral arteriolar spasm, resulting from reflex vaso-constriction impulses arising in the thrombo-phlebitic segment of vein, and carried by the sympathetic fibres. This arteriolar constriction accounts for the whiteness of the skin (*phlegmasia alba dolens*) and because of the anoxæmia, produces increased permeability of the arteriolar and capillary beds, with excessive transudation of fluid from the vascular system into the intercellular spaces and the rapid onset of œdema.

Aseptic ligation of a comparable vein does not produce this phenomenon.

Phlebo-thrombosis.—In this condition, in contradistinction to thrombo-phlebitis, there is the formation of an intravenous thrombosis, due mainly to venous stasis and changes in the blood constituents, and with little involvement of the vessel wall. Consequently there is here, a reddish, relatively friable clot, mainly composed of erythrocytes and very similar to coagulation *in vitro*. This thrombus is only casually attached to the vein wall, and embolizes readily. The lack of an acute inflammatory process with its associated pain, fever and vaso-spasm, renders recognition of this condition difficult until embolism has occurred.

This differentiation, of which more will be said later, has great therapeutic significance, in that recognition of these respective processes will permit of the institution of appropriate measures of treatment.

All too often these terms thrombo-phlebitis and phlebo-thrombosis are used as if they were completely interchangeable and were merely synonyms for the same ailment. True, they have in common the factor of intravenous thrombosis, but beyond that are as different as the poles, and so also are their treatments.

DIAGNOSIS

Clinically the diagnosis of acute thrombo-phlebitis offers little difficulty. More often than not the patient volunteers the information of a pain in the leg and a glauce at the temperature chart will almost clinch the diagnosis even before the limb is examined. The elevation of temperature, usually fairly marked; the pain, tenderness, œdema and the pale, somewhat glazed, appearance of the limb, together with the appearance of acute illness, are all relatively unmistakable: and, paradoxically enough, the more acutely ill the patient, the better the prognosis as regards embolism.

Phlebo-thrombosis, on the other hand, is much more insidious in its onset, and its detection is much more difficult. Possibly the most important diagnostic symptom is an increased pulse rate, out of proportion to any temperature elevation, the latter being usually slight. Mahler⁸ emphasizes this and describes it as a stepladder pulse.

Certainly any postoperative patient who has, about the 8th to 10th day, a very small rise of temperature (say to 99° only) accompanied by a disproportionate rise of pulse, should be carefully examined for the presence of phlebo-thrombosis. This examination should include the plantar aspects of the feet, particularly on the lateral side, since, as shown by Neumann⁹ the initiating thrombus not infrequently occurs in the plantar veins.

Squeezing the feet, squeezing the calf, and the dorsi-flexion sign of Homans and examination of the femero-iliae veins should be carried out. Quite commonly the only complaint of the patient with phlebo-thrombosis may be "tender toes", and in this respect it is interesting to note that Connor¹⁰ found that 12 out of 22 patients suffering from typhoid fever, and complaining of tender toes, had phlebo-thrombosis of the leg.

In doubtful cases, or in cases of suspected phlebo-thrombosis where it is of importance to

localize the clot accurately, phlebography should be done. This is of particular importance in the cases of patients who have suffered a small, non-fatal pulmonary infarct, since, as Zink¹¹ has shown, in 70% of cases of fatal pulmonary embolus, the patient had suffered a previous minor infarction; the result of embolus.

TREATMENT

It is here that one meets with a great diversity of opinion, and bitter controversy between those who uphold anti-coagulant therapy and the advocates of radical surgical procedures. In some centres practically no veins are tied, in others, very large numbers are so dealt with, many even as a purely prophylactic preoperative measure. The Mayo Clinic, and the Boston group might be cited respectively as the most ardent protagonists of these two schools of thought.

Gordon Murray of Toronto has now treated some 2,500 patients with anti-coagulants without a case of fatal pulmonary embolus while under treatment, though it is understood that there have been cases of severe, and even fatal, haemorrhage in this series. However, it is a fact that many eminent authorities are firm believers in the use of heparin, dicoumarol and hirudin in the treatment of these conditions of intravenous thrombosis, as opposed to surgical intervention.

Certainly, though it is generally agreed that anti-coagulants will have no effect upon an already existing thrombus, anti-coagulants should be used in these cases: firstly, as a prophylactic measure, to attempt to forestall thrombosis which might occur in parts other than the one primarily affected; and secondly, to prevent the formation of a propagating thrombus.

The best treatment is, of course, prophylaxis and all, or as many as possible of the predisposing and initiating factors should be eliminated prior to operation. Consideration should also be given to the type of operation proposed; since intestinal and gastric operations, particularly for malignancy, hernias, prostatectomies and amputations of limbs, are some of those notoriously prone to lead to the development of thrombosis. In many clinics the prophylactic use of anti-coagulants is a routine in these cases.

Postoperatively, early ambulation has been hailed as possibly the greatest single factor in diminishing the incidence of thrombosis. It is interesting, however, to note that in thoracoplasty operations for pulmonary tuberculosis, where the patient is necessarily bedfast for months before and after operation, the incidence of thrombosis and embolism is extremely low.

Published figures, however, seem to indicate very definitely that early ambulation has materially reduced the morbidity and mortality rates of pulmonary embolism, in postoperative patients in normal general hospital practice. Failing this, pressure bandages applied to the lower extremities, bed exercises, massage, etc., are all advocated by various authorities. One cannot help but feel, however, that once a condition of intravenous clotting has occurred, pinning one's faith exclusively to anti-coagulants is, perhaps, expecting too much of them, and that, particularly if there has been one non-fatal pulmonary infarct, some more active measures to protect the patient from a fatal accident should be initiated. In this connection it is essential that a differential diagnosis between acute thrombo-phlebitis and phlebotrombosis, together with an accurate estimation of the clot level, be made. It is felt that the treatment of the two conditions differs widely, and this is the reason for stressing the differential diagnosis.

Acute thrombo-phlebitis.—As has been previously mentioned, unless in the rather rare event of suppuration, embolus is relatively unlikely in this disease. Consequently, conservative treatment, including the use of anti-coagulants, should be the rule.

Novocaine block of the sympathetic ganglia controlling vaso-constriction in the affected limb is the initial method of choice, though some authors advocate continuous caudal anaesthesia as being superior. Lumbar ganglionectomy may be indicated in resistant cases. Daily blocks will, as a rule, suffice, and it is only rarely that more than two or three will be needed. As a rule, pain is immediately relieved, and the fever and oedema have generally disappeared at the end of 48 hours.

If this procedure is carried out early and the limb is not permitted to remain painful and oedematous for any length of time, leading to great dilatation of the intercellular spaces, the

sequelæ of the painful and œdematosus "milk leg" will be rarely encountered. In the event of septic necrosis of the clot—a very unusual occurrence—radical surgery, with ligation of veins well above the affected area, even up to and including the inferior vena cava, must, of necessity be initiated immediately the condition is diagnosed. This may be done alone, or if the condition of the patient will permit, in conjunction with thrombectomy.

One feels that, if possible, prevention of embolus by high ligation should also be accompanied by extirpation of a suppurating thrombus, on the general principle of the removal of any focus of infection.

Phlebo-thrombosis.—Here is an entirely different set of circumstances, requiring an entirely different mode of treatment. The condition is, as has been pointed out, much more insidious in its onset, and more difficult of detection, yet, if one is on the watch for it, is fairly readily recognizable. In this disease, the primary danger is not to the limb, but to the life of the patient. There is no ischaemia, and little vaso-spasm, but there is a great liability to embolization, and treatment must be directed toward the prevention of a catastrophe. Consequently it is felt that the treatment here is early and radical surgery.

Phlebography may be done to localize the clot if there is doubt on clinical examination, and the vessel or vessels must be tied well above it. Thrombectomy has been advocated, but it is difficult to justify it, and, in the opinion of the author, is futile. Once one has ligated a vessel above the thrombosed area, one cares little what happens to the distal portion, and, indeed, normally it will become thrombotic, whether or not there has been a pre-existing thrombus present. Under these circumstances it would appear to be "gilding the lily" to remove a primary thrombus, only to have it replaced by a secondary one. It would seem that the only reason for thrombectomy below ligation is the suspicion that the clot might suppurate.

Ligations to combat intravenous thrombosis have become popularized in comparatively recent years, and the boldness of the surgical approach has been remarkable. Surgeons have ascended the venous tree (anatomically, and perhaps Hibernially, speaking) to its trunk. Attacks upon the saphenous vein, and the

superficial femoral vein rapidly gave place to ligations of the common femoral and iliac veins, and then the inferior vena cava became a site of election, with gratifying results in the main, and a rather surprising absence of œdema, once sufficient time had elapsed for the establishment of a collateral venous drainage system.

Whilst this appears to be, at first sight, a very radical procedure, clinical experience has demonstrated that, if it be done early, and a sufficient lapse of time be not permitted for the development of marked peri-venous inflammation with exudate, which fills the vascular sheath and directly stimulates arterial spasm, one may be reasonably assured of having, as an end result, a limb, or limbs, without pain or œdema, and with normal function.¹²

The later stage, of course, where a heavy greyish cement-like substance about the vein may be found on exposing it, giving rise to stimulation of perivascular nerves and painful vaso-constriction belongs more properly to the post-phlebitic limb, and as such, is beyond the scope of this paper but it should be emphasized that the development of the post-phlebitic leg, which is an awesome problem for any surgeon to treat, is, more often than not, a sequel to either lack of, or poor treatment of the initial lesion.

SUMMARY

The literature has been reviewed and the underlying pathological lesions in intravenous clotting have been discussed. An attempt has been made to differentiate between two types of intravenous thrombosis and to indicate the rationale of varying the treatment in accordance with the particular type present in any given case.

The question of the use of anti-coagulants alone, as opposed to surgery is discussed.

CONCLUSIONS

1. There are two distinct mechanisms leading to intravenous thrombosis.
2. The results of these are clinically and physiologically so different as to produce what might be termed two allied, but different diseases.
3. The treatment of each is different.
4. Early attempt should be made to determine which type of thrombosis is present

special attention was given to noting whether the abnormal shadows remained stationary or tended either to increase or to decrease in size.

Practically all of the patients included in this study were permitted to continue at work while the status of their pulmonary disease was being assessed. Of the 443 cases 224 (73.14%) were given no special treatment at any time; 75 (16.93%) were, at some time during their period under supervision, advised to take extra rest out of working hours; 45 (9.93%) were advised to give up work and to enter a sanatorium. It may be well to point out here that a goodly proportion of the patients for whom sanatorium care was recommended had, due to the lack of suitable accommodation, to attempt to take the cure in their own homes.

The final step in the review described herein consisted in ascertaining the status, in terms of *Diagnostic Standards* (1940), of all 443 patients, as of December 31st, 1945. This was done to permit of study, in the light of subsequent developments, of the respective rôles of physical findings, x-ray findings and laboratory findings in the assessment of the status of each patient's pulmonary disease on his admission to the clinic as well as to secure information with respect to the results of supervision and treatment of all 443 patients up to December 31, 1945.

ASSESSMENT OF STATUS

(a) *Physical findings—râles.*—Râles were found in 20 (7.04%) of the 284 patients in this series who were given physical examinations soon after they reported to the Clinic for advice. Twelve of the 20 patients in whom râles were found were permitted to continue at work. Seven were advised to take extra rest out of working hours. One was advised to follow a sanatorium regimen.

The status of the pulmonary lesions of the 20 patients in whom râles were detected was, as of December 31, 1945, as follows:

Active	0
Quiescent	3
Apparently arrested	3
Arrested	13
Undetermined	1

(b) *X-ray findings.*—Serial x-ray pictures of 329 of the 443 patients included in this study showed no change of note as between the first

film showing evidence of disease and the most recent film. Serial x-ray pictures of the 443 patients showed signs either of progression or of retrogression of disease. The x-ray findings of an additional 46 patients were such, as of December 31, 1945, that it was deemed advisable to simply classify them as indefinite.

Of the patients whose serial x-ray pictures showed no change of note 252 (76.59%) were permitted to continue at work; 57 (14.28%) were advised to take extra rest; 20 (6.07%) were advised to follow a sanatorium regimen. The status of the pulmonary lesions of the 329 patients whose serial x-ray pictures revealed stationary abnormal shadows was, as of December 31, 1945, as follows:

Active	2
Quiescent	14
Apparently arrested	45
Arrested	261
Apparently cured	4
Undetermined	3

The findings in the 68 patients whose serial x-ray pictures showed evidence of change in abnormal shadows while under supervision may, to advantage, be considered under two headings, namely: (1) those of patients—29 in number—in whose x-ray pictures the abnormal shadows showed a tendency to increase in size; and (2) those of patients—39 in number—in whose x-ray pictures the abnormal shadows tended to decrease in size.

Twelve (41.37%) of the 29 patients whose serial x-ray pictures showed evidence of an increase in size of abnormal shadows were, for one reason or another, allowed to continue at work; 17 (58.62%) were advised to take extra rest or to follow a sanatorium regimen. The status of the pulmonary lesions of these 29 patients, as of December 31, 1945, was as follows:

Active	11
Quiescent	11
Apparently arrested	3
Arrested	4
Apparently cured	0
Undetermined	0

Of the 39 patients whose serial x-ray pictures showed evidence of a decrease in size of abnormal shadows, 23 (58.97%) were permitted to continue at work and 16 (41.02%) were advised to take extra rest or to follow a sanatorium regimen. The status of the pulmo-

nary lesions of these 29 patients, as of December 31, 1945, was as follows:

Active	3
Quiescent	5
Apparently arrested	5
Arrested	24
Apparently cured	0
Undetermined	2

(c) *Laboratory findings — sputum and/or gastric contents.* — Acid-fast bacilli similar morphologically or culturally to *M. tuberculosis* were found in specimens of sputum or gastric contents of 25 (11.73%) of the 213 patients in this series from whom specimens were obtained. Three of the patients in whose specimens of sputum or fasting gastric contents acid-fast bacilli were found were reported, on physical examination, to have had râles. The serial x-ray pictures of these three patients were classified as showing no change of note.

Eleven of the 25 patients in whose specimens of sputum and fasting gastric contents acid-fast bacilli were found were classified, from an x-ray standpoint, as having stationary pictures; 14 were classified, from an x-ray standpoint, as having pictures which showed signs either of progression or of retrogression of their disease. Of these 14, 8 showed signs taken to be indicative of retrogressive changes. It may not be amiss to point out here that specimens of sputum and/or fasting gastric contents of 26 of the 29 patients whose serial x-ray pictures showed signs of progression of their disease were examined for evidence of *M. tuberculosis*, whereas specimens of sputum, of only two-thirds of the 39 patients whose x-ray pictures showed signs of retrogression of their disease, were similarly examined.

Of the 25 patients in whose sputum or fasting gastric contents acid-fast bacilli similar to *M. tuberculosis* were found, 8 were, for one reason or another, allowed to continue at work; 7 were advised to take extra rest out of working hours; and 10 were advised to follow a sanatorium regimen.

The status of the pulmonary lesions of these 25 patients, as of December 31, 1945, was as follows:

Active	9
Quiescent	5
Apparently arrested	3
Arrested	8
Apparently cured	0

RESULTS OF TREATMENT

The simplest method to employ in attempting to ascertain the results of using physical, x-ray and laboratory findings as described herein, in the assessment of the status of tuberculous lesions of minimal extent in the lungs of persons who are asymptomatic, and of treating patients whose disease is considered active, in the manner herein set forth, appears to be to record the status of the pulmonary lesions of all of the patients under consideration at some fixed date. The status of the pulmonary lesions of the 443 cases included in this study, as of December 31, 1945, was as follows:

Active	18
Quiescent	32
Apparently arrested	57
Arrested	302
Apparently cured	4
Undetermined	30

Examination of the foregoing table shows that, as of December 31, 1945, 363 (81.94%) of the 443 patients included in this study had apparently arrested, arrested, or apparently cured disease and that only 50 (11.28%) of the entire group had active or quiescent disease. This appears to be a reasonably good result, if allowance is made for the following facts: (1) that 30 patients (6.76%) had been under supervision too short a time as of December 31, 1945 to warrant a statement as to the status of their pulmonary disease. (2) That most of the patients had to be permitted to continue at work until it became clearly evident that their disease was active. (3) That a few patients who were known to have active tuberculosis were, through force of circumstances, obliged to continue to work and to limit their cures to whatever rest they could secure out of working hours. It leaves much, however, to be desired, in that 50 persons who were found on routine x-ray examination to have minimal pulmonary tuberculosis and were promptly referred to the clinic, still had active or probably active disease six months or more after they first reported for medical advice.

DISCUSSION

The foregoing observations seem clearly to indicate that a significant proportion of persons, found as a result of routine or mass x-ray examination to have minimal pulmonary tuberculosis, can be expected to deny symp-

toms even remotely suggestive of this disease and that a significant percentage of those who deny symptoms can be expected to have tuberculosis in an active form at or about the time their pulmonary disease is discovered. The cases of asymptomatic minimal pulmonary tuberculosis which form the basis for the present study constituted 31.02% of the total number of cases of minimal pulmonary tuberculosis under supervision and treatment by this Hospital on December 31, 1945. This is a much lower percentage of asymptomatic cases than that reported by Reisner and Downes³ in their series of 469 cases of minimal pulmonary tuberculosis. The latter observers reported, it will be recalled, that 75% of their cases had no significant symptoms at the time of initial diagnosis. The fact that a goodly percentage of the cases of asymptomatic minimal pulmonary tuberculosis included in this study were found to have active disease within a few weeks of the time they first came under supervision, seems to indicate that careful inquiry regarding symptoms is not as valuable a guide in the recognition of active disease as Bobrowitz's and Dwork's² observations suggest might be the case.

The study lends weight to the now widely held view that physical examinations, including special efforts to detect latent râles, are of little or no value in the assessment of the status of minimal pulmonary tuberculosis in seemingly well persons.

The observations recorded herein demonstrate that serial x-ray pictures are of inestimable value in the assessment of the status of asymptomatic minimal pulmonary tuberculosis. The criteria employed in the interpretation of the serial x-ray pictures of the patients included in this study differed from those used by Reisner and Downes³ and by Kruger, Potter and Jaffin.⁴ The criteria employed herein had, for the most part, to do with lack of change, or changes, in the size of the abnormal shadows rather than with the character of the abnormal shadows at the time the disease was discovered, or at some subsequent date. The fact that only 16 of the 329 patients, whose serial x-ray pictures showed no significant change in the size of the abnormal shadows during their periods of supervision and treatment, were classified as having active or quiescent disease on December 31, 1945, seems to indicate that

stationary abnormal shadows constitute a reasonably accurate guide to the status of tuberculous lesions of minimal extent discovered on routine x-ray examination of seemingly well persons. The fact that all of the 329 patients whose serial x-ray pictures showed no change of note could not be classified as having apparently arrested, arrested, or apparently cured disease at the end of the period under review, indicates that stationary abnormal shadows cannot always be taken to mean that the disease which they depict is inactive. One other observation with respect to the serial x-ray pictures of the patients included in this study seems to deserve special comment. The findings recorded herein suggest that patients in whose serial x-ray pictures the abnormal shadows show a tendency to decrease in size are almost as certain to have active lesions as the patients in whose x-ray pictures the shadows show a tendency to increase in size. Comparison of the status, as of December 31, 1945, of patients in whose serial films the abnormal shadows tended to decrease, and of those in whose films the shadows tended to increase, seems clearly to indicate that the former group of patients is likely to do better than the latter group in so far as arrest of their disease is concerned.

This study demonstrates that examinations of specimens of sputum or gastric contents for tubercle bacilli can, even in patients who present x-ray evidence of only minimal pulmonary tuberculosis and who deny cough and expectoration, be an invaluable aid in the assessment of the status of lesions. Specimens submitted by, or collected from, 213 of the patients whose findings form the basis for this study, were examined. Acid-fast bacilli, morphologically or culturally similar to *M. tuberculosis* were found in specimens from 25 of these 213 patients. The patients in whose sputum or gastric contents tubercle bacilli were found were not a selected group, except in the case of those whose serial x-ray pictures showed signs of change in the size of the abnormal shadows. It seems reasonable, therefore, to expect that tubercle bacilli might have been found in specimens submitted by, or obtained from, more patients if it had been possible to obtain more specimens and, perhaps, to make more examinations for tubercle bacilli by means of cultures. The findings recorded herein show that the serial

x-ray pictures of 11 of the 25 patients, in whose sputum or gastric contents tubercle bacilli were found, presented stationary abnormal shadows. This seems to be a clear indication that examinations of specimens of sputum submitted by, or collected from, patients with so-called asymptomatic minimal pulmonary tuberculosis must, as several recent investigators' reports tend to show, be given much more attention in the assessment of the status of tuberculous lesions of minimal extent than has been the case in the past.

Finally, the fact that approximately 82% of the 443 cases of asymptomatic minimal pulmonary tuberculosis whose findings form the basis for this study, could be classified as having apparently arrested, arrested, or apparently cured disease on December 31, 1945, in spite of the fact that lack of sanatoria facilities made it impossible to give approximately half of the known cases of active tuberculosis the kind of treatment which they really should have been given, seems to add weight to the view that the prognosis is good in most cases of minimal pulmonary tuberculosis found on routine x-ray examination of seemingly well persons. It is regrettable that slightly over 11% of the cases included in this study had to be classified as having active or quiescent disease at the end of the period of observation. Such evidence as is available at present suggests that adequate sanatoria facilities for patients found to have active lesions of minimal extent may be expected materially to reduce the numbers and the percentage of those who fail to arrest their disease.

SUMMARY

The findings of 443 persons, who were found on routine or mass x-ray examinations to show signs clearly indicative of minimal pulmonary tuberculosis and who could not recall having had any complaints suggestive of tuberculosis in the weeks and months prior to the discovery of their disease, have been reviewed in an effort to assess the efficacy of certain objective criteria, namely: (1) Physical examinations, including special efforts to detect latent râles; (2) serial x-ray pictures, and (3) examinations of specimens of sputum or gastric contents for acid-fast bacilli morphologically and culturally similar to *M. tuberculosis*.

This review has demonstrated that physical examinations, including a search for latent

râles, are of little or no value in the assessment of the status of tuberculous lesions of minimal extent. It has, on the other hand, shown that serial x-ray pictures, and examinations of specimens of sputum or gastric contents obtained from patients who deny cough and expectoration, are invaluable aids in the assessment of the status of minimal pulmonary tuberculosis found on routine x-ray examination of seemingly well persons.

The findings recorded herein seem clearly to indicate that bacteriological examinations of specimens of sputum submitted by, or collected from, patients with so-called asymptomatic minimal pulmonary tuberculosis should, as several recent investigators' reports tend to show, be given more attention in assessment of the status of tuberculous lesions of minimal extent than has been the case in the past.

Classification of the status of the tuberculous lesions of the 443 patients whose findings constitute the basis for this study shows that on December 31, 1945, the lesions in approximately 82% were either in an apparently arrested, an arrested or an apparently cured state. This observation seems to indicate that the criteria used in the assessment of the status of the lesions of these patients at the time that their disease was discovered yielded reasonably accurate results. It is regrettable that approximately 11% of the patients included in this study proved to have active or quiescent lesions at the end of the period of observation. Such evidence as is available at present suggests that lack of adequate sanatoria facilities for the treatment of persons found to have active tuberculous lesions was a factor in preventing these patients from bringing their disease under control.

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ACUTE PANCREATIC ÖDEMA

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THE writer's interest in the subject of acute pancreatic œdema (synonyms: acute interstitial pancreatitis, acute transient pancreatitis or subacute pancreatitis) was aroused by the following case.

Mrs. A.B., aged 43, weight 250 pounds, married and the mother of eight children, was seen at her home January 27, 1948, with severe epigastric and right subcostal pain of eight hours' duration. The pain was described variously as boring and colicky and was referred through to the back. There had been nausea and vomiting prior to my arrival. There had apparently been minor attacks of epigastric pain for the previous three weeks. The urine was said to be dark but the stools were not clay coloured. There was a history of abdominal pain, diagnosed as gall bladder trouble fifteen years before. There had also been two operations, one for sterilization and one for removal of a fat pannus. The temperature was not elevated and the pulse was 66 per minute. There was tenderness in the epigastric and right subcostal area, but little splinting or rigidity. No masses were palpable. The lower abdomen was quite soft. She was considered to be having a gall stone colic, probably from a common duct stone, and was given morphine grains $\frac{1}{4}$ and atropine gr. 1/150 hypodermically.

Little or no relief was obtained and the patient was admitted to hospital late the same afternoon. On admission, she was somewhat cyanosed and was obviously in severe pain: temperature 97.4° , pulse 80 and the blood pressure 165/115. The morphine was repeated and local heat applied. The pain gradually abated but during the next three or four days she had repeated attacks of a minor character, with nausea and vomiting on two occasions, and complained of pain in the left upper quadrant now rather than the right. The temperature ranged up to 101.8° F. Urinalysis on admission showed +1 sugar and a trace of bile. Urinary diastase on the morning of January 28 showed 128 units (normal 6 to 32 units).

An electrocardiogram recorded only left axis deviation. A cholecystogram was reported as revealing a non-functional gall bladder with no evident stones.

The symptoms abated, fever subsided and operation was performed February 6. A gall bladder, not at all acutely inflamed, but containing many small stones was seen. The common duct was dilated and a calculus was palpable in its lower end. The pancreas was the seat of a firm, lobulated enlargement without evidence of fat necrosis or hemorrhage. Cholecystectomy, and choledochostomy (after removal of the palpable stone), were performed. Culture of the bile subsequently exhibited colon organisms. The patient made a good recovery, the T-tube being removed on the sixth post-operative day. The tract drained only a small quantity of bile for 24 hours and has since remained healed.

The pathological report of the gall bladder was "Chronic productive cholecystitis with cholelithiasis".

When seen on March 2, the patient had only a trace of sugar and was entirely free from pain.

The existence of a type of mild, transient pancreatitis involving the whole or part of the gland has been remarked on by many surgeons, being usually seen at operations per-

formed for disease of the biliary system. Halsted¹ noted it in 1890 when he operated on a patient for acute obstruction and found only a hard, indurated pancreas. He closed the abdomen and recovery ensued. It was further suggested by Archibald,² in 1913, when he reported the ease of a young man who had several acute but transient attacks of agonizing epigastric pain with localized epigastric tenderness and who, at operation, revealed a diffusely swollen pancreas without fat necrosis or hemorrhage. The abdomen was closed and the patient recovered. The belief was expressed that many of the cases of acute epigastric pain disappearing within a few hours or more, and ordinarily diagnosed as of gastric or gall stone origin, were really examples of this mild form of pancreatitis.

In 1922 Zoepffel³ stimulated clinical interest when he reported four cases in which, at operation, the pancreas was found to be swollen and œdematosus but where no hemorrhage or necrosis was present. In two of them there was some fat necrosis and in two a stone was present at the papilla of Vater. Microscopic examination of a biopsy in two cases revealed no evident necrosis. Analyzing 2,137 cases of pancreatitis in 1927, Schmieden and Sebening⁴ reported 44% as showing only œdema and fat necrosis without hemorrhage or necrosis of the gland. Elman⁵ in 1933, surveyed the literature on the subject and summarized 37 cases of acute interstitial pancreatitis in a detailed analysis. It was his definite opinion that the cases represented a distant pathological entity and were not merely an early stage in the development of pancreatic necrosis. Other authorities, however, including Boekus,⁶ feel that œdema of the pancreas represents, to quote, "only a form of acute inflammation in which the causative agent is less fulminant or is active only transiently!"

The pathogenesis of acute interstitial pancreatitis is, of course, bound up with that of acute pancreatitis in general. Rich and Duff in 1936⁷ confirmed that acute pancreatitis could be produced by the injection of practically any irritant, from bile and duodenal secretion, to weak acids or alkalis, calcium chloride, formaldehyde and formic acid, etc., into the pancreatic duct. They said that the resulting pancreatitis was due to the rupture of acini and ductules and:

"If the cells at the sites of the ruptures are damaged by the irritant or spread further apart by inflammatory oedema, the openings will not become promptly sealed up, as occurs after the injection of bland fluids, and if pancreatic juice of sufficient trypsin potency escapes and comes into contact with large arteries, vascular necrosis with resulting haemorrhage, thrombosis, tearing of the gland and infarction will produce the picture of haemorrhagic pancreatitis!"

Chisholm and Seibel,⁸ using the experimental method described by Rich and Duff,⁷ injected freshly aspirated bile from the gall bladder into the duct of Sautonini in dogs. When less than 2 c.c. of bile at less than 18 cm. of water pressure was injected slowly, the ductal tree of the pancreas was filled but not ruptured. Acute oedema of the pancreas was seen to develop within a few minutes. The lobules were seen separated by a transparent transudate. Microscopically, this showed some leucocytes but mainly interacinar oedema. When 2 to 11 c.c. of bile were injected at a pressure greater than 18 cm. the ductal tree was ruptured, the intralobular oedema became bile stained and in a short time small petechiae appeared in the acinar substance. Microscopic examination of pancreatic sections now showed extravasated erythrocytes, leucocytes, fibrin and granular debris. Several hours after injection this type of pancreas showed fat necrosis on the gland and adjacent peritoneum. Using ten acute experiments in a 12 hour period, they showed that when the smaller amount was injected and the ducts not ruptured, serum amylase levels rose rapidly but tended to return to nearly normal by the end of that period. At autopsy these dogs showed only oedema of the pancreas. On the other hand, where the larger amounts were injected under the greater pressure, and where necrosis was evident later at autopsy, the serum amylase levels continued to rise even at the end of the period.

Similarly, following a series over a 7 day period, they found that the cases of pancreatic oedema had amylase levels which rose rapidly but which soon declined toward normal. The cases which later showed pancreatic necrosis, however, had higher enzyme levels which only slowly subsided.

It was established by Rich and Duff⁷ that trypsin freed by the rupture of ducts and acini, and activated by calcium ions of the tissue fluids, and in contact with large pancreatic vessels, could produce haemorrhagic pancreatitis, this without the presence of enterokinase which ordinarily activates tryp-

sinogen. Ingestion of alcohol or a heavy meal was found to increase the trypsin and, therefore, the destructive power of the juice, while conversely starvation produced a juice of lesser potency. Hence the occurrence of acute haemorrhagic pancreatitis following on a heavy meal or an alcoholic bout, and perhaps the milder pancreatic oedema may be associated at times with a juice of lower trypsin potency.

The mode of activation of the pancreatic juice clinically is still in much dispute. The "common channel" theory whereby a reflux of bile, often infected, takes place into the pancreas is the obvious answer, but it does not explain a good many cases. Opie,⁹ in 100 routine autopsies, found a common ampullary system in 89. Perhaps the consensus of numerous surveys suggests that in only 65 to 75% of cases do the bile and pancreatic ducts communicate. In 40 to 70% of pancreatitis cases, gall stones have been found in the gall bladder but in less than 5% (Schmieden and Sebening¹⁰) has a stone been found at the ampulla of Vater.

Archibald¹¹ proposed and strongly supported the theory of spasm of the sphincter of Oddi to explain those cases where no obstruction by stone or other cause was present. Evidence which supports the "common channel" theory is the fact that pancreatic ferments have been found in the gall bladder in many cases of pancreatitis and that the gland itself in pancreatitis often has a yellowish or greenish colour (7 out of 37 of Elman's⁵ cases showed this). Rich and Duff,⁷ on the other hand, advocate metaplasia of the pancreatic ducts as the obstructing factor in most cases, and this would certainly explain some cases of localized pancreatitis and others where no connection with the biliary system is evident. A few cases have definitely been found to be due to obstruction of the pancreatic duct by tumour, stricture, worm or duodenal diverticulum. At any rate, it would seem that the common factors in all cases are the presence of obstruction and the action of trypsin.

Clinically, interstitial pancreatitis has important features. A majority of such cases have had recurrent attacks of pain over weeks or years, often with complete relief between attacks. Elman's⁵ series contained 24 (of 37) cases with previous attacks. In many of them no gall bladder lesion is found. Indeed, in one

case reported by Amadon¹⁰ where there had been attacks of what were considered to be typical biliary colic, the pancreas was found to be indurated but no gall bladder could be found at all.

Pain, the main symptom, may be prostrating and paralyzing like peptic ulcer perforation, or colicky with distension like an obstruction. It was severe enough that, in Elman's⁵ series, 13 out of 30 cases in which it was recorded, were operated on within 24 hours. In most cases the pain is epigastric but it may be fairly generalized, or right or left subcostal. It may go through to the back and occasionally to the shoulder. The sensation of an epigastric band has also been mentioned. Shock and cyanosis are usually less than in hemorrhagic pancreatitis, but may occur. Nausea and vomiting are common. Local tenderness is generally epigastric but may be right or left subcostal. Glycosuria is a fairly common finding, and there may be bile in the urine. Enzyme studies reveal a raised serum or urinary diastase. It is interesting to note that in Elman's⁵ cases, 6 were diagnosed as intestinal obstruction, 7 as cholecystitis, 9 as perforated ulcer, 1 as appendicitis and one as a perforated gall bladder.

Pathological findings of Elman's⁵ cases revealed edema of the pancreas and peritoneum over it, often spreading into the mesocolon and adjacent duodenum. The parenchyma of the gland was swollen and often hard and indurated. Microscopically there was no evident necrosis but marked infiltration of acute inflammatory cells into the interstitial tissues between lobules as well as acini, often with evidence of edema. In 16 of 35 cases reported the gall bladder was diseased, with or without stones. Fat necrosis was evident in 15 cases without evidence of gland necrosis.

The treatment is undoubtedly conservative in the acute phase. Shock must be treated primarily where it is found. Probably the only cases subjected to emergency operation should be those where perforation of a viscus cannot be definitely excluded even with the aid of the diastase tests. In this regard McKorkle and Goldman¹¹ state that an increased serum amylase is specific for acute pancreatitis with the occasional exceptions of acute parotitis and certain kidney diseases with impaired excretion. They state that in 43 cases of acute pancreatitis it

was elevated in every case, and that in acute abdominal disease, "when the amylase test is done within the first 2 or 3 days of the acute illness, a low or normal reading is of considerable value in eliminating the likelihood of acute pancreatitis". It has been established that the result of repeated tests parallels closely the clinical course of the condition. An exacerbation of pain is often marked by a rise in the diastase level, and an improvement by a lowered reading. (The exception to this is in the end stages of pancreatic necrosis when the gland is all but spent and the diastase is no longer being excreted). As we have seen, the diastase level tends to fall rapidly in pancreatic edema and more slowly in necrosis. The value of urinary over serum diastase estimations is that the former remains elevated somewhat longer and therefore may allow of recognition of the condition after the serum diastase has returned to normal.

Some clinicians have utilized serum lipase estimations as an alternative or coincidentally. It was found by Elman¹⁰ to be elevated in 17 out of 20 proved cases of acute pancreatitis. In such emergency operations, cholecystostomy is probably the treatment of choice in most cases. Incision and drainage of the pancreas are no longer considered necessary except where suppuration has taken place and an obvious abscess is present. In those cases which subside under conservative management, investigation and treatment of biliary disease when it is present are urgently called for.

McGrave¹¹ reported obtaining a history of previous milder attacks of pancreatitis in 7 of 9 cases who died of acute pancreatic necrosis and upon whom autopsies were done. Similarly, Stetten¹² reported recurrent attacks in 12 of 14 cases studied. It is felt also that this milder type of pancreatitis may be a forerunner of pseudocysts, abscess formation and perhaps, chronic pancreatitis. There is, as well, a real danger of diabetes developing in a gland recurrently attacked. It is estimated that 2 to 3% of acute pancreatitis cases become diabetics. It would therefore, seem highly expedient to attempt to prevent further attacks if at all possible. Prophylactically, avoidance of alcohol, large rich meals and control of obesity are to be desired. Small, frequent, low-fat feedings should be prescribed. Where radiological investigation of the biliary tract is suggestive, operation should be carried out.

A diseased gall bladder, with or without stones, should be removed and, in every case, the common duct should be explored and drained.

It would seem logical that prolonged drainage of the common duct, or alternatively, choledocho-duodenostomy might be of value in those recurrent cases where no obstruction or biliary disease was found, to prevent development of the chronic condition. For those recurrent cases with intractable pain where no obvious cause is evident, or where the pain persists after operation, De Takats¹³ has advocated a diagnostic paravertebral block, from 6th to 10th dorsal, and if this gives relief, states that unilateral splanchneectomy and ganglionectomy should be done.

SUMMARY

A case of acute pancreatic œdema with chronic cholelithiasis and a stone in the common duct is presented.

A survey is given of some of the literature on the subject.

A plea is made for the recognition of this mild type of pancreatitis, whether as a separate entity or as a stage in acute haemorrhagic pancreatitis is immaterial, and for investigation of the biliary tract in every case. When biliary disease is present the common duct should always be explored.

CONGENITAL ATRESIA OF THE NASOLACHRYMAL DUCT*

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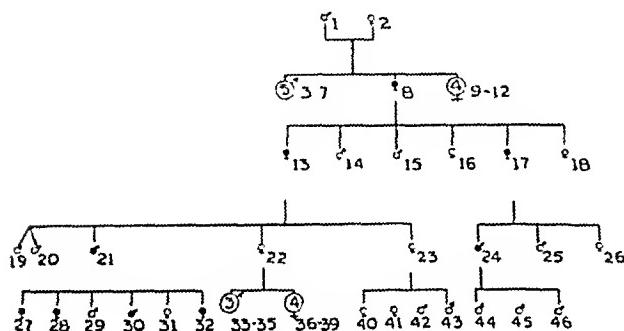
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THERE is perhaps no branch of biology which plays so important a rôle in heredity as does the science of ophthalmology. Of the variety of conditions that may present themselves, not the least important is obstruction of the lacrymal passages. A series of cases of congenital dacryostenosis recurring in four generations is herein presented.

A knowledge of embryology is essential to appreciate fully the developmental anomalies. Mann,¹ in describing the development of the lacrymal passages, states that the sac and nasal duct originate as a cord of buried epithelium formed by the maxillary process. The tucked-in epithelium separates from the surface and by budding from its upper end maps out the canaliculi and puncta. The caruncle is developed by a snaring-off of the part of the lower lid fold medial to the opening of the inferior punctum. All the passages are at first blocked out in solid epithelium, and only canalize just before birth. The last part to open is the lower end of the nasal duct which is at times closed by a thin membrane even at birth. Defects of three types may be found. Either the passages do not develop, or the epithelial buds from them will pursue an abnormal course or the apparatus will fail to canalize. All these conditions are known to occur. Gunn² cites the possibility of the cartilage being at fault. At birth the cartilages representing the lacrymal, superior maxillary, and inferior turbinate bones bound the duct more or less completely, being thickest toward the lower end of the duct where it is crossed by the turbinate. In the fetus there are cartilages which later disappear, and are ~~not permanently represented by any bone in the adult~~

The present series of cases of congenital atresia has occurred in four generations with nine members affected (Fig. 1). These families have lived mainly in the Province of Ontario, and four members (V, 27, 28, 30, 32) were admitted as patients to the Hospital for Sick Children in Toronto. Although six of the affected persons were females, this distribution between the sexes is not statistically significant.

Fig. 1
Pedigree over five generations of the occurrence of Congenital Atresia of the Nasolacrimal Duct



CASE REPORT

The case now presented was a seven-year old girl (V-27), who was first admitted for treatment with a diagnosis of chronic bilateral conjunctivitis. The history revealed that tearing had been present since birth with periodic recurrent acute attacks of conjunctival inflammation. The mother was an American Indian, while the father was descended from English ancestors, his great grandparents having come to Canada as immigrants. Three siblings of V-27 suffered from a similar affection as well as her father (IV 21) who has had the malady all his life. His offspring consisted of six children, five living and one dead. The deceased child (V 31), stillborn at term, had a marked deformity of the head, the nature of which was not determined. Of the five remaining children only the older boy (V 29) showed no malformations. Examination of the eldest daughter (V 27) revealed bilateral dacryostenosis, absence of the superior puncta and an internal strabismus. The second (V 28) and third (V 32) daughters showed similar manifestations without the squint. Developmental anomalies of the same nature could be demonstrated in the youngest boy (V 30). In addition there was noted a horn-like outgrowth which deformed the distal phalanx of his left fifth finger; this had been present since birth. Mentally all the children were alert and had shown satisfactory progress at school. It is interesting to note that the eldest daughter exhibited artistic tendencies well above the average.

The father had two sisters and twin brothers, the twins (IV 19, 20) were born one month prematurely and had died at the age of two weeks. It was not known whether any congenital anomalies existed in their case. The oldest sister (IV 22) was not examined, but as far as could be determined she had no complaints in reference to her eyes or any other part of the body. Her offspring consisted of three boys (V 33, 34, 35) and four girls (V 36, 37, 38, 39)—all normal. The youngest sister (IV 23) bore four children, two girls (V 40, 41) and two boys (V 42, 43), but here again no anomalies could be demonstrated.

Related to the father (IV 21) were three first cousins, two males (IV 24, 25) and a female (IV 26). The

latter died of scarlet fever at an early age and from all reports was not abnormal. Information received in respect to the youngest cousin (IV 25) revealed no usual features with the exception that he manifested difficulty in distinguishing colours. The oldest cousin (IV 24) stated that he had tearing of both eyes for as long as he could remember, especially troublesome with cold or windy weather. When examined it was noted that he had a bilateral ptosis as well. The drooping of the lids was stated to have increased in recent years. His three sons (V 44, 45, 46) upon examination had no symptoms or eye abnormalities.

The mothers (III 13, 17) of the two affected cousins came from a family of six; two of these had suffered from tearing all their lives. The other four members, two males (III 14, 15) and two females (III 16, 18) were said to be normal. As five in this generation were deceased, the survivor (III 15), an elderly man gave no history of tearing and when examined showed no abnormalities.

Little information could be obtained about the second generation illustrated in Fig. 1. This family consisted of five males (II 3, 4, 5, 6, 7) and five females (II 8, 9, 10, 11, 12). The only affected member was female (II 8), the mother of the third generation. She had suffered tearing from both eyes all her life. The other descendants of this second generation could not be traced. The parents (I 1, 2) of these ten children had come from England but were not affected.

COMMENT

A genealogic tree illustrating the occurrence of congenital dacryostenosis over five generations has been presented. Of 46 members 9 were afflicted with the anomaly, three males and six females. It is evident from this pedigree that this rare anomaly was inherited as a dominant factor. It is interesting to note that the anomaly first appeared in generation II, where only one individual out of ten was affected. It would seem that the defect arose as a mutation in individual II 8, who passed the defect on to two of her six children in generation III. In the following generation IV, two out of eight members inherited the defect. But in generation V the offspring of an American Indian and English union showed a much more frequent incidence with four out of six siblings affected.

This variation among the generations in the frequency of occurrence may on the one hand be due entirely to chance sampling, but on the other hand it raises the question of the penetrance of the dominant factor. It is now established that a few dominant genes produce their trait in every individual carrying the gene. The best example of dominant genes which have complete penetrance are the dominant genes for the blood group series O, A, B, and AB. Other dominant genes have incomplete penetrance, varying from 90%, 60%, 10% to a fraction of a per cent. The reduced penetrance is due to inhibiting effects of other inherited factors or of environmental factors.

The following table shows the expected and observed numbers of offspring in generations III to V.

TABLE I.

TABLE SHOWING THE EXPECTED AND OBSERVED NUMBERS OF OFFSPRING IN GENERATIONS III TO V OF A FAMILY WITH CONGENITAL ATRESIA OF THE NASOLACHRYMAL DUCT

	No. of off-spring	Expected No. affected	Observed No. affected	% of penetrance observed
Generation III	6	3	2	
Generation IV	8	4	2	
Totals....	—	—	—	
Generation V	6	3	4	57 133

The complete penetrance of the dominant gene in generation V may be due to factors of incompatibility resulting from the mixed American Indian and English cross. This incompatibility may lie in the inherited differences for the growth of the bridge of the nose and surrounding skeletal parts. The combined patterns of growth of the Indian and English having led to an incompatibility which allowed the easier penetrance of the abnormality of the nasolachrymal duct.

On the other hand, the increased penetrance may be the result of a maternal and fetal incompatibility. Recent research has suggested that such incompatibility may result from differences in racial genetic make-up. If a maternal and fetal incompatibility existed, then the developing embryo would find itself in an unfavourable uterine environment in which the dominant gene could more successfully penetrate.

SUMMARY

1. A genealogical tree showing the occurrence of congenital atresia of the nasolachrymal duct over five generations is reported. A total of 46 members is recorded, of which 9 were found to be afflicted with the anomaly. This pedigree shows an inheritance of the dominant nature.

2. The question of penetrance of the dominant factor is commented upon.

3. A table illustrating the expected and observed numbers of offspring in generations III to V is presented.

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PRESENT STATUS OF GOLD THERAPY IN RHEUMATOID ARTHRITIS*

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THE recent conference in Ottawa, under the chairmanship of the Hon. Paul Martin, Minister of the Department of National Health and Welfare, which established the Canadian Arthritis and Rheumatism Society, again emphasized that rheumatoid arthritis is a major public health problem. Although the actual cause and specific cure of this disease are still unknown, it is exciting to contemplate and speculate on the effect of the inauguration of a new era in science, because the atomic age, with consequent increased activity in physics, biochemistry, bacteriology and pathology, should inevitably make an important contribution, before many years, to our knowledge of rheumatoid arthritis.

However, even if there is no specific treatment, no trained observer will deny that a combination of different measures is, in many cases, most helpful. Syphilis was treated with mercury for years before the discovery of the *Treponema pallidum*, and rickets with cod-liver oil before we had any idea of vitamin D and its various constituents. So it is felt today by many physicians that injections of gold salts should be used for the treatment of rheumatoid arthritis in combination with general measures of rest both mental and physical (including local rest of the involved joints by temporary bivalve splinting when necessary), adequate diet, physical medicine (physio- and occupational therapy), eradication of obvious foci of infection as a general health measure, and symptomatic care as indicated, such as analgesics, blood transfusions and iron medications.

* Read before a meeting of the Rheumatology Section of the Montreal Medico-Chirurgical Society on April 15, 1948.

the inherent risks of the treatment are concerned, as Philip Hench¹¹ has pointed out: "Surgeons and patients do not hesitate to accept the risks of cholecystectomy or hysterectomy to relieve symptoms much more bearable than those of progressive rheumatoid arthritis. Yet the mortality rates of such procedures are as great or several times greater than those of chrysotherapy".

In view of all the foregoing, the use of gold salts seems entirely justified (1) in cases of progressive rheumatoid arthritis unrelieved by a reasonable, but not too long, period of older and safer methods of treatment; (2) when the patient clearly understands and accepts the risk; and (3) when the physician is in a position to give the treatments with the necessary clinical and laboratory safeguards.

So far as the actual method of treatment is concerned, there is some slight variation. In Montreal, at the Royal Victoria Hospital we use solganol-B oleosum, and at the Queen Mary Veterans' Hospital, myoehrisine. To date, no appreciable difference has been noted in their therapeutic effect. We give all injections intramuscularly. The doses are in milligrams and always given at weekly intervals. The first dose is 10 mgm., the second is 25 mgm., and the third and subsequent ones 50 mgm. until a total of 985 or 1,035 mgm. has been administered. This means twenty-one or twenty-two weeks' treatment. Subsequently, our plan is to continue at monthly intervals with 50 mgm. for sixty months in all, if, in the interval, nothing better is discovered for the treatment of this disease. The reason for setting the period at five years is because, according to the standard of rheumatologists, no ease of rheumatoid arthritis is considered as cured until it has remained inactive for five years. Otherwise, it is categorized as an arrested ease. The reversibility of the disease has been noted on several occasions, and, in some cases, the period shortened to two or three weeks, and, in others, the amount increased from 50 to 100 mgm. in large men.

We have not treated with gold salts any children suffering from rheumatoid arthritis, but, obviously, in children smaller doses should be used. During the treatment, a complete examination with urinalysis and a haemogram is made monthly; and weekly, the patient questioned regarding any untoward symptoms, blood pressure is recorded, mouth, throat and skin inspected, and routine urinalysis carried

out. If any evidence of toxicity appears, gold therapy is temporarily withheld, and further indicated investigations carried out. Under the above system of dosage, this rarely occurs when the following absolute contraindications to gold therapy have been eliminated: history of purpura, agranulocytosis, renal or hepatic disease, pregnancy, haemophilia, severe diabetes mellitus, colitis, severe anaemia or any haemorrhagic tendency, severe eczema or chronic dermatitis, severe bronchial asthma, or any serious systemic disease other than rheumatoid arthritis or psoriasis. The commonest complications which occur following the administration of gold salts are the various dermatitides (one of the chief characteristics being extreme itchiness), stomatitis, presence of albumin or red blood cells in the urine, G.I. symptoms such as nausea and epigastric distress. After a suitable period of observation, the gold injections usually can be continued, but if the symptoms reappear, as a rule injections of gold salts are discontinued. When the following complications occur, gold injections are permanently discontinued: purpura haemorrhagia, severe exfoliative dermatitis, ulcerative enteritis, acute yellow atrophy of the liver, aplastic anaemia and agranulocytosis.

A few patients complain of additional pains in the joints and temporary increase in joint swelling and stiffness for twenty-four hours following an injection. Usually after the seventh or eighth injection, the pain lessens and the swelling commences to subside. Later, the sedimentation rate begins to fall. Sometimes improvement does not occur until the end of the period for weekly injections, and, in a small group of cases, the pathological change is irreversible. The most satisfactory results are, as a rule, obtained in the early cases when the inflammatory process is chiefly limited to the soft tissues. In the more advanced cases, with marked muscular atrophy and cartilaginous erosion, the results are, of course, not so spectacular. However, even in these patients, the inflammatory process may be checked and the swelling and pain reduced.

SUMMARY

The present status of therapy in rheumatoid arthritis is reviewed, especially in reference to the use of gold salts, with discussion of methods now being more generally employed and detailed description of those in force at

the Queen Mary Veterans' Hospital and the Royal Victoria Hospital in Montreal.

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RÉSUMÉ

Avec l'usage de fortes doses de vitamine D, celui des sels d'or demeure actuellement au premier plan dans le traitement des arthrites rhumatoïdes. Forestier employa le premier les sels d'or, par la voie veineuse, mais on préfère de nos jours l'injection intra musculaire. Les sels les plus employés sont le thiomalate d'or et de sodium, (Myoehryrine) et le thio glucose aurique (Soganol-B) en suspension huileuse. Chacun de ces sels contient environ 50 p. 100 d'or métal et se donne en doses hebdomadaires de 50 milligrammes, sauf pour la première qui est de 10 milligrammes, et la deuxième de 25. Au bout de vingt-et-une semaines, on espacera les injections d'un mois. Les sels d'or permettent l'arrêt du processus arthritique dans un grand nombre de cas, après l'essai infructueux des autres moyens thérapeutiques (physiothérapie, immobilisation, repos général, élimination des foyers infectieux, transfusions). Il importe cependant de faire appel à tous ces moyens avant de recourir à la chrysothérapie, à cause des manifestations toxiques dont celle-ci peut s'accompagner. Elles comprennent une dermatose prurigineuse, une stomatite, l'albuminurie ou l'hématurie, la nausée. Des complications plus graves, purpura, entérite ulcéreuse, atrophie jaune aiguë du foie, anémie aplastique et agranuloeytose, contre-indiquent absolument la poursuite du traitement. Il y a avantage à se servir du BAL dans les cas d'intoxication par l'or.

PAUL DE BELLEFEUILLE

EXPERIENCES IN PERIODIC HEALTH WORK*

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WITH the object of trying to give some idea of where the periodic health examination fits into personal preventive medicine, I presume to relate some impressions derived from sixteen years' experience in directing the periodic health work for three of our Canadian Life Insurance Companies (Confederation Life

Association, The London Life Insurance Company and the Sun Life Assurance Company of Canada), and also one of our large industrial organizations.

The prevention of disease falls into two parts: (1) That directed by our Public Health Departments, which can be termed "Community Preventive Medicine". (2) That directed to the individual which is "Personal Preventive Medicine" and which is subdivided into "Immunization" and "Periodic Health Examinations". Therefore, it is noted that periodic health examinations are an integral part of preventive medicine, and it is in the use we can make of these examinations that I wish to make some suggestions.

The ordinary men and women we meet every day are more interested in their health than they were twenty years ago. This is evidenced by the increasing number of syndicated health articles in our daily and weekly press and by articles on health (?) in our popular magazines. We, the profession, know that many such articles are not worthy of attention by any thinking man or woman, but do the public know that? An article on cholesterol as the cause of high blood pressure, etc., appeared recently in one of the most widely read of the monthly periodicals. Shortly after its appearance the writer was having lunch with some business men. Three-quarters of them had read the article and some were quite prepared to forego milk and eggs for the rest of their lives on the basis of the article. We know the accuracy of information thus obtained is often in serious question. What are we going to do to correct the situation?

The public are extremely interested in health, and it devolves upon us—the medical profession—to see that their interest is an intelligent interest, and the advice they get is accurate and to the point. The interest could, and too often does, become a morbid one. The annual health examination, conducted by the family physician, is our best means of preventing this.

Health can be improved, life expectancy and physical efficiency can be stepped up and last, but very important, a more comfortable old age can be assured. There is no use in endeavouring to extend the life span unless the individual is able to enjoy it. A grouchy old age is not desirable. These things can be ac-

* An address to the final year class in Medicine at the University of Western Ontario, London, Ont., November 17, 1947.

Since 1931, when the Canadian Medical Institute started offering periodic health examinations to policyholders of our companies, there has been a very marked improvement in the advice given by the examining physician. For the benefit of those of the profession who do not do these examinations, we should like to state that our policy has always been for the examiner to give the advisee to the examinee. We feel that the examiner—in contact with the policyholder—can give much better advice than that coming from a central office. We, in our turn, back up the advice of the examiner, giving emphasis to his advice when needed. In addition, general health advice is given where it may be required. Fifteen years ago, the examinations were, in many cases, conducted like the examination a man has before taking out life insurance. The doctor was obviously looking for organic disease, gross errors in living conditions, etc., rather than tracking down and correcting tendencies which would make organic disease a certainty in the future. Today that is to a great extent changed for the better. The advisee now is much more on health and the maintenance of a healthy body than formerly. To a great extent this may be due to the teaching in our universities. During the last ten years every medical school in Canada has given at least one hour's lecture on the value of the periodic health examination. This is a definite step in the right direction. High blood pressure and organic heart impairment may be definitely established before the patient is warned by symptoms. In most cases these symptoms are discovered at the routine health examination, and something can be done before it is too late. It is not such a shock to learn that you may develop disease as to learn that you have it.

However, there is still room for improvement in the periodic health examination, particularly in the method of giving advice and in the information given to the examinee. Bear in mind that the periodic health examination is for the apparently well person who wants to maintain his health. It is not a periodic health examination when a man, who has obviously been "unwell" for some time, comes to your office and asks for a check-up. Bearing that point in mind, let me state that no person should leave the physician's office after a

periodic health examination with fear in his mind. If he is pronounced fit, he should be grateful. If any impairment has been found he should also be grateful, although it is only human that he wouldn't be so happy about the latter finding. This is again the time for the family physician to step into the rôle of adviser and friend.

One of the most common fears the laity have today is the fear of high blood pressure. This need not be so. Now, what are you going to tell a case of elevated blood pressure? The most important thing to be considered is what not to tell him. First and foremost, except in unusual circumstances, no case should be told the blood pressure readings. I was interested to hear Dr. Wright Young, Bell Telephone Company, Toronto, in an address in Montreal last October, state that they did not tell people their blood pressure reading. If more physicians followed this plan it would be better for the public. In the reports that go out from our office no person with hypertension is ever told the examiner's blood pressure findings. The other extreme of the blood pressure reading—i.e., hypotension—is too often suggested to the examinee as being an impairment. Low blood pressure is usually not significant where there is no organic or infectious disease present, where the individual is free from overfatigue, infection of chest, teeth, tonsils, etc., and is taking sufficient exercise. Quite frequently these people, who have, obviously, no other impairment, are cautioned against exercise, advised to rest and to take medication.

In doing a periodic health examination keep in mind that faulty health habits, unbalanced diet, poor chest expansion, overweight even as little as ten pounds, lack of rest and relaxation, may be the cause of physical disability in the future of the examinee.

In conclusion, let me again urge you to give health advice to your patients by means of periodic health examinations. No one can do it better. It will be appreciated and, if practised by all, will result in a more satisfied and a healthier public. I cannot think of a better time to thank the two thousand or more physicians in Canada who do examinations for us every year. I wish to commend them for the care and attention they are giving our examinations.

CASE REPORTS

COMPOUND DISLOCATION OF ELBOW
JOINT WITHOUT FRACTURE

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The following case of compound dislocation of the elbow joint without fracture is being reported because of some of the interesting features which it exhibits and because reports of these cases are very rare. It is very common to have fracture dislocations of the elbow but actual compound dislocations unaccompanied by fracture are few and far between. A few such cases have been reported, one a late case reported because of orthopaedic treatment some years after injury and one which was associated with rupture of the brachial vessels. Our case was quite uncomplicated and has made a full recovery. It is detailed below.

The patient, a stout middle-aged woman suffered an injury on September 14, 1946. She fell down some cement steps against an iron railing crushing her elbow and twisting her forearm. This caused a compound dislocation in which the humerus projected through the skin. She was attended by Dr. H. O. Singer of Welland and brought to the Welland County General Hospital. X-ray examination was entirely negative for fracture but a lateral dislocation of the forearm was present.

Clinical examination showed the humerus projecting through the skin at the medial side of the elbow joint from a 3" laceration. There was slight duskeness of the hand and considerable swelling about the elbow. The radial pulse though not as good as on the opposite side was fairly satisfactory. She also had suffered a 6" laceration in the right leg below the knee which is unimportant. Her general condition was very good so she was taken to the operating room soon after admission. A great deal of time was spent preparing the skin and finally the laceration was lengthened and debrided. The triceps tendon and joint capsule were frayed and this damaged tissue was excised. The joint was inspected and found intact except for the dislocation. This could readily be reduced but recurred until the rent in the capsule and the triceps tendon had been repaired with chromic catgut. The ulnar nerve was found lying near the rent in the capsule and was apparently uninjured. We were afraid that it might be included in scar and for this reason it was dissected free both upwards and downwards and transplanted under deep fascia at the front and the medial side of the elbow joint in the upper part of the forearm. At the end of operation the elbow joint appeared to be perfectly reduced and it had full motion and was stable. It was placed in a padded cast at a right angle. The wrist was in mid-position. The skin of the incision was not closed. Penicillin 100,000 units was injected into the joint. She was given penicillin for 4 days postoperatively as well as sulfathiazole by mouth.

On September 25, 1946, the cast was removed. Secondary suture of the incision was done but this could not be completed until a postero-lateral relaxing incision was made. This bare area was immediately covered by a split-thickness skin graft from the abdominal wall. A right-angled cast from axilla to palm was again applied.

COMMENT

This case clearly demonstrates the value of chemotherapy and early operation. The good result achieved could not have been possible without the use of advances such as these in treatment.

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BACTERIAL ENDOCARDITIS
(STREPTOCOCCUS VIRIDANS) IN AN
EIGHTEEN-MONTHS OLD INFANT
SUCCESSFULLY TREATED WITH
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Bacterial endocarditis has been described in all decades ranging from birth¹ to extreme old age. It is, however, relatively rare in infancy, where the underlying basis is almost invariably a congenital cardiac defect, most commonly a patent interventricular septum or patent ducus arteriosus.² Sansby and Larson² reviewed the world's literature in 1930 and found only 5 cases of acute bacterial endocarditis in children under 7 months of age.² Gelfman and Levine,³ reporting 34,023 autopsies, noted only 5 cases of congenital heart disease with bacterial endocarditis below the age of 2 years. Davis and Weiss⁴ reviewed 5,125 consecutive autopsies and recorded no cases of the disease under the age of 10 years. In 5,250 reported cases of bacterial endocarditis of Kelson *et al.* the youngest patient was 2½ years old. Christie's⁵ recent account of 269 cases of endocarditis treated with penicillin indicates the youngest to be 7 years. A search of the literature up to May, 1948, appears to show only one recorded case of endocarditis, the child not surviving.⁶ For this reason, it has been thought worthwhile to report the following case of *S. viridans* endocarditis, in an eighteen-months old baby.

D.E., an eighteen-months old white male infant, was admitted to the Royal Victoria Hospital on December 18, 1947. Both parents were healthy and this was the first child. The baby was full term, weighed 5 lb. 3 oz. at birth and labour was said to have been easy.

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The parents were told shortly after birth that the infant suffered from a cardiac abnormality. There was no history of rubella or any illness in the first trimester of the mother's pregnancy.

From birth to 3 weeks before admission the child seemed remarkably healthy. It was raised on an exemplary paediatric regimen, received the usual inoculations and was never observed to be ill in any way. The parents noticed no dyspnoea or cyanosis. It developed at a normal rate, weighed 23 lb. at one year and appeared active, bright and happy.

Five weeks before admission, the child became cranky, lost its appetite and seemed feverish. A physician treated the baby over a period of one month with sulfonamides but the child developed increasing irritability, pallor, and listlessness, lost much weight and was persistently febrile. The parents, one week before admission, noticed the child seemed dyspnoeic and blue when crying. Further inquiry contributed nothing to the history, except that the baby had scratched himself incessantly for the past 2 weeks.

Physical examination revealed an emaciated infant with a ghost-like pallor. He seemed exhausted and seriously ill and in almost a frenzy of irritability and fear. There was marked dyspnoea and the lips showed a faint lavender cyanosis. Ears, mouth, nose and throat were not remarkable except for the pallor of the buccal mucous membranes. There was a tiny petechial hemorrhage in the left lower conjunctiva. There was minimal generalized lymphadenopathy. The respiratory rate was 50 per minute and the child was frankly dyspnoeic. The lungs were clear. A slight systolic thrill was felt over the praecordium. A loud, harsh, short systolic murmur obliterated the first sound over the praecordium and was best heard over the third interspace to the left of the sternum. The apical rate was 170 per minute and regular. There was no venous engorgement. The liver was firm and palpable 3 fingers' breadth. The spleen was just palpable. Multiple fresh and old purpuric spots were seen over the neck and forehead. Almost the whole body was covered with scratch marks. There was no oedema. The rest of the physical examination was not remarkable. There was no jaundice.

A diagnosis of patent interventricular septum with a superimposed bacterial endocarditis was made. The child was seen by Dr. G. R. Brow, who agreed with the diagnosis of interventricular septal defect.

Investigation showed the red blood cells to number 2,800,000 and white blood cells 28,000 with a differential of 21 stabs, 57 polymorphonuclears, 18 lymphocytes and 8 monocytes. The haemoglobin was 10.1 gm. %. The sedimentation rate was 9 mm. per hour. The platelets numbered 160,000. The coagulogram was within normal range. The Wassermann was negative and old tuberculin (1:1,000) negative, as was the urine. An electrocardiogram on December 19 showed an A-V conduction time of 0.1 seconds. The rate was regular and 170 per minute. There were moderately deep Q₁ and Q₂ deflections and T₁ was diphasic. This was repeated on February 9. It was essentially the same except for the appearance of a Q₃ spike and T₄ had reverted to a positive deflection. Non-protein nitrogen measured 22.1 mgm. %, total protein 6.37 gm. %, with albumen 3.56 gm. %, and globulin 2.81 gm. %. Cephalin cholesterol was 3 plus, thymol turbidity 9.7 units, and thymol flocculation 5 plus. Chest film showed the heart to be moderately enlarged and globular in shape. The broncho-vascular patterns were intensified. Blood cultures on December 21 and 22 grew 40 colonies of *S. viridans* per ml. of blood and 200 colonies per plate respectively. The bacteria were inhibited by 0.05 units of penicillin.

On admission the child was transfused with 250 ml. of whole blood.

Report of the positive blood culture was received on December 22 and on this date the infant was empirically placed on 125,000 units of penicillin given every three hours, as it appeared too critically ill to consider

waiting for the report on the penicillin sensitivity of the organism. This dosage gave a level of one unit of penicillin per ml. of blood at the end of 3 hours. The organism was found to be sensitive to 0.05 units of penicillin. Despite this overwhelming dosage the child continued febrile, up to 102° F. (rectal) daily, for a further period of 8 days, and the white blood cells remained around 30,000. By January 1, after ten days of treatment, the temperature became essentially normal and on January 4 the penicillin was reduced to 60,000 units every three hours, giving a penicillin level at the end of 3 hours of 0.5 units per ml. Over the next 2 weeks the temperature fluctuated between 99.6 and 101° F. (rectal) and the white blood cells fell to 14,000. Clinically, the infant did not seem much improved. In this period the baby was given one gram of caronamide (4-carboxyphenylmethane sulfanilamide) every 4 hours. This did not raise the penicillin level. It was increased to 2 gm. every 4 hours, but this specimen of blood for penicillin level was unfortunately broken.

On January 17 (25 days after onset of treatment) the child became more dyspnoeic and cyanosed and the temperature rose to 104.5° F. (rectal). A friction rub was detected in the right chest and signs of pleurisy and effusion in the area developed over a period of 2 days which were confirmed by roentgenogram. The white blood count rose to 36,000.

At first it was considered that this might represent an embolic phenomenon, but as the fever and signs persisted it was felt that the infant had developed pneumonia and pleurisy from a penicillin-resistant organism. Actually, naso-pharyngeal swabs grew no pathogens. The child was given sulfadiazine (one gr. per lb. per day) and within 72 hours the temperature fell to normal and remained so till discharge. Co-incidentally, there was marked clinical improvement. The dyspnoea decreased and the appetite became almost voracious. The infant, who had been listless, irritable and mute, uncovered a bright, active, talkative nature and gained weight. In the meantime, the spleen had disappeared and the liver measured only one finger breadth below the costal margin. The skin ceased being irritable and the scratching stopped. Six blood cultures, at weekly intervals, were sterile. Penicillin had been given for 39 days and totalled 26,000,000 units. The baby was discharged on February 16 looking much improved. The heart murmur was much the same. At this time the haemoglobin was 12.6 gm. %, and white blood count 7,200. Interestingly, three months later the red blood count numbered 5,700,000 and the haemoglobin 17.6 gm. %.

The child has continued to do well and gain weight, but shows a degree of fatigue and dyspnoea on exertion which was not present before his illness. This would suggest some further damage to the heart from the bacterial invasion. One might suspect an increase in the size of the septal defect and some mixing of arterial and venous blood in view of the relatively marked erythrocytosis which has developed since his discharge from hospital. Six months following the termination of treatment, the child has shown no signs of relapse.

SUMMARY

A case of *S. viridans* bacterial endocarditis in infancy has been reported. The child was treated with massive doses of penicillin with apparent complete recovery.

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BENIGN STRICTURE OF THE LOWER OESOPHAGUS TREATED BY RESECTION AND OESOPHAGO-GASTRIC ANASTOMOSIS

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Mr. D.W.K., aged 39, was admitted to Westminster Hospital December 27, 1945, complaining of (1) upper abdominal pain—4 weeks' duration; (2) vomiting—4 weeks' duration.

He had been discharged from Westminster Hospital on November 8, following treatment for bleeding "peptic" ulcer and had returned to work for one week when he had a recurrence of the above symptoms. He remained at home one week on a milk diet and then was advised to enter a hospital. The vomiting and pain became worse. There was some blood in the vomitus.

Past history.—He developed "indigestion" in 1941, which was relieved by "stomach powder". In March, 1945, he had a perforation of a duodenal ulcer which was repaired. He was in hospital five weeks and returned to duty at the end of three months. He was discharged from the Army, Category E, in May, 1945. He remained well until September, 1945, when the pain recurred and he had a severe hemorrhage for which he was admitted to Westminster Hospital.

The functional inquiry was negative and the family history contained nothing relevant.

Physical examination.—He was thin and pale. Blood pressure 112/84. Examination was negative except for the abdomen which was scaphoid, with notable pulsation in epigastrium, synchronous with pulse. Upper right rectus scar present, well healed. Marked epigastric tenderness on palpation but no rigidity. No visible peristalsis.

Urinalysis, acid, 1.012 to 1.032 specific gravity. No albumen or sugar. Haemoglobin, 70%; red blood cells, 4,200,000; white blood cells, 7,300; standard and presumptive Kahn, negative. Faeces negative for occult blood; non-protein nitrogen, 30 mgm. %; sedimentation rate, 6 mm.; fasting gastric analysis in May, 1945, had shown free HCl. 70. Barium swallow and meal on September 21, at Westminster Hospital showed a normal oesophagus and stomach except for evidence of increased gastric peristalsis. The duodenal bulb seemed fairly well formed on the screen but subsequent film studies all showed an old cicatricial distortion, without evidence of active ulcer crater or obstruction.

Gastro-intestinal series which had been carried out at another hospital on December 15, were reported as showing a gastric ulcer high on the lesser curvature of the stomach close to the oesophageal entrance, and also a duodenal ulcer which caused considerable delay in emptying of the stomach. Barium meal on December 28, showed considerable change in the upper G.I. tract since the previous examination. Some delay was noted at the

lower end of the oesophagus which appeared narrowed. A definite sharp filling defect about three quarters of an inch in length was present above the cardiac orifice. Two subsequent barium meals with radiological studies on January 28 and February 12, 1946, respectively, failed to show evidence of oesophageal obstruction. A small duodenal ulcer without obstruction was reported.

The patient was placed on medical management following a surgical consultation. He continued satisfactorily until March 1, when he began to have difficulty in swallowing and lost about 10 pounds in weight. Another barium swallow was carried out on March 11, which showed "a rather abrupt stoppage to the barium flow at a point one inch above the cardiac orifice. From this point a tiny trickle of barium flowed into the stomach". (Esophagoscopy was done on March 28, by Dr. F. S. Kennedy. The whole length of the oesophagus was observed. There was no evidence of stricture down to the cardiac orifice. It was suggested that the patient was suffering from early cardiospasm.) The patient was given a thread to swallow and dilatation by means of bougies was attempted. A 35F dilator was completely blocked and no further attempt at dilatation



Fig. 1.—Microscopic examination revealed diffuse inflammatory infiltration of the thickened portion of the oesophagus with lymphoid hyperplasia of the associated lymph glands.

was carried out. However, there was some improvement in his swallowing, but obstruction to solid foods persisted.

Esophagoscopy under general anesthesia was again carried out on June 14. The oesophagus was observed down to the cardiac orifice but the esophagoscope did not pass the cardia. Attempted dilatation of the stricture at the cardia was unsuccessful. It was felt that there was an organic stricture of the oesophagus in the cardiac area that might be malignant.

The patient was transferred to the Surgical Service after surgical consultation and on July 9, Dr. A. J. Grace carried out a one-stage partial oesophago-gastrectomy. The oesophagus was found to be bound down by dense fibrotic tissue which was gradually freed by means of blunt and sharp dissection. The left phrenic nerve was blocked with novocaine. The diaphragm was incised and the stomach and lesser omentum explored. Several small firm glands suggestive of malignancy were palpated in the lesser omentum.

Approximately one and one-half inches of the cardiac end of the stomach was resected together with a large

part of the lesser omentum following division of the left gastric artery and vein between ligatures. The distal portion of the stomach was closed with clips (Von Petz clamp), continuous intestinal chromic catgut, and a layer of interrupted No. 50 cotton sutures. The oesophagus was then freed by blunt dissection up to behind the left lung root. Section of the oesophagus one-half inch below the left lung root was carried out between intestinal clamps and the specimen was removed.

The stomach was then drawn up into the left pleural cavity and anchored by means of No. 50 cotton sutures to the posterior and mediastinal parietal pleura well above the lower end of the remaining portion of oesophagus, to prevent any tension on the anastomotic suture line. A three layer anastomosis between the oesophagus and stomach was then carried out by interrupted No. 50 cotton sutures according to the technique of Sweet. The diaphragm was repaired and the left phrenic nerve crushed. The wound was closed in layers, a catheter being left in the left pleural space through a stab wound in the ninth intercostal space for closed drainage and controlled suction.

Pathological examination of the specimen showed the oesophageal portion to be considerably thickened, measuring up to 0.8 cm. in thickness. A probe could be passed through the narrowed lumen; the open specimen showed the mucous membrane of the oesophagus to be intact but considerably congested. Immediately distal to the cardiac opening of the stomach there was a small, superficial, ulceration measuring 1 x 0.6 cm.

Postoperative management.—A Levine tube was inserted into the stomach following the operation and Wangensteen drainage was continued for two days, after which feeding through the tube was commenced and continued for fourteen days. Patient was put on soft diet of multiple small feedings. His convalescence was uneventful except for some gaping of the skin wound when the sutures were removed on the seventh day and resuturing was required. He was allowed to leave hospital as an outpatient 22 days after operation and was discharged finally, on November 28, 1946. At that time he had no distress on taking foods. He followed a fairly rigid bland diet and routine with multiple small meals.

This patient has been seen from time to time in the Surgical Clinic, and was last examined on February 11, 1948, when he stated that he was still unable to eat big meals and had gas after food. He was gaining in strength and was not having a great deal of stomach distress unless he got too tired. Gastric analysis at this examination showed complete absence of free HCl. The G.I. series showed: (1) Satisfactory post-operative oesophagogastric anastomosis. (2) Chronic hypertrophic gastritis. (3) Chronic duodenal ulcer with extensive scarring.

DISCUSSION

Oesophagitis occurs more frequently than does any other pathological condition of the oesophagus. Only a small percentage give rise to symptoms (10%). Acute ulcerative oesophagitis is a common finding at necropsy. Reflux of gastric secretions which are irritating to the oesophageal mucosa, is considered the most important etiological factor. It therefore occurs in diseases with vomiting and high gastric acidity. Prolonged intubation is not thought to be an important factor unless pre-existing oesophagitis be present. Oesophagitis is most often encountered in patients who have gall bladder

disease, duodenal or gastric ulcer, obstructing lesions of the upper gastro-intestinal tract and oesophageal hiatus hernia.

In most cases the inflammation subsides without leaving any ill effects. However, repeated episodes of oesophagitis may lead to a progressive cicatrization of the lower part of the oesophagus, as occurred in this case. Harrington believes that repeated episodes of ulcerative oesophagitis and healing are usually responsible for the short oesophagus type of diaphragmatic hiatus hernia. Recognition of the fact that oesophagitis is a common complication of disease of the upper part of abdomen is important. Neutralization of gastric secretions with antacids, elevation of the head of the patient's bed, and early corrective surgery are important prophylactic measures. Nasal feeding tubes should be used with some discretion if oesophagitis is suspected.

If cicatrization and stricture occur, oesophagoscopy should be carried out to rule out malignancy. Most benign strictures respond to dilatation over a previously swallowed thread. Only cases not responding to this form of therapy require surgical intervention.

I wish to thank Dr. A. J. Grace, Associate Professor of Surgery, University of Western Ontario, and Dr. C. C. Ross, Director of Surgery, Westminster Hospital, for permission to publish this case.

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RUPTURE OF AORTIC ANEURYSM INTO THE SUPERIOR VENA CAVA WITH OBSTRUCTION*

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The explosive onset of superior vena caval obstruction is dramatic and occurs characteristically when an aortic aneurysm ruptures into the superior vena cava. The following report of such a case is presented because of its clinical interest and to demonstrate how the application of venous catheterization in the investigation established an accurate diagnosis. Another case not previously reported is described briefly, and

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one in which an aneurysm of the aorta ruptured into the auricle of the right atrium is mentioned.

An arteriovenous fistula between the aorta and superior vena cava is generally recognized to be rare. Armstrong, Coggins and Hendrickson¹ in 1939 added 2 cases to 98 previously reported and collected by them from the literature. According to these authors Beevor,² in 1832, was the first to report such a case. Seven others were added and are given by reference in a paper on the superior vena caval syndrome by Hussey, Katz and Yater³ in 1946; they included an additional case of this complication as a cause of superior vena caval obstruction.

Mrs. A., a housewife, aged 44 years, believed she was in good health prior to her present illness. About five o'clock in the afternoon of September 8, 1947, during the act of bending forward to pick up an article, she experienced a snap low in her neck which she stated felt as if something had broken; this was followed rapidly by a sensation of fullness and tightness in her head and neck. Half an hour later a physician observed

attachment to the rib cage. No pulsation was apparent in these venae but peripheral capillary pulsation was present in the nail beds of her fingers. Swelling of the tissues of the neck prevented identification of the external jugular veins. Her finger-nail beds were pink; there was no clubbing.

On examination of the cardiovascular system there was increased dullness on percussion at the level of the second intercostal space; the left border of dullness was estimated to be 4 cm. and the right border 6 cm. from the midline at this level. The apex impulse was palpable 10 cm. to the left of the midline in the fifth intercostal space. Cardiac rhythm was regular at a rate of 90 per minute. The heart sounds were normal at the apex. A loud, continuous, machinery-like murmur with systolic accentuation was heard over the upper part of the chest anteriorly, maximal in intensity over the second right intercostal space, 3 to 4 cm. from the midline. Over this area a systolic thrill was faintly palpable. Widespread transmission of the systolic murmur occurred throughout the right side of the thorax. The diastolic element of the murmur was easily heard along the left sternal border, and was transmitted towards the apex. Blood-pressure in both arms was 98 mm. Hg. systolic, and 45 mm. Hg. diastolic. Both femoral arteries were easily palpable.

The remainder of the physical examination revealed no abnormal findings. The trachea was in the midline



Fig. 1.—Chest film, in the recumbent position, taken immediately after removal of the cardiae catheter. The aneurysmal sac is faintly outlined to the right. Fig. 2.—Cardiae catheter, with tip in the right ventricle. Photograph retouched to aid contrast.

the face, neck, upper thorax and both upper extremities to be cyanosed. He found the patient frightened and apprehensive but without pain or respiratory distress. A loud, continuous murmur over the upper sternum was reported on auscultation. On admission to hospital, some three hours later, she complained of a choking sensation in her throat and of swelling and increased fullness in her head, neck, face and arms. There was no pain and her breathing was not difficult.

Her family history and functional inquiry contained nothing relevant to the present illness. The patient was born and lived all her life in Canada. She had one daughter, aged twenty years and in good health. There had been no miscarriage and there was no history suggestive of venereal disease.

On physical examination the patient was in obvious discomfort, propped up in bed, but not short of breath. There was a deep reddish-blue suffusion in the skin of her face and neck, in both upper extremities and the upper thorax extending down to the level of the second rib anteriorly and the seventh thoracic spine posteriorly. There were numerous superficial venae visible over the thorax, especially at the level of the diaphragmatic

TABLE I.
CASE NO. 18718 (T.G.H.): CARDIAC CATHETERIZATION,
SEPTEMBER 11, 1947.

Location of sample	Mean pressure Cm. H ₂ O.	Mean pressure Mm. Hg.	Oxygen content volumes per cent	Saturation per cent
Right ventricle	22 0	16	13 6	78 5
Right atrium.	4 5	3	14 5	84 0
Superior vena cava.....	44 0	32	15 9	92 0
Sup. vena cava: 1.5 em. proximal to previous sample	74 0	54		
Axillary vein.	40 0	29	10 5	61 0
Femoral artery			14 8	85 5
Femoral artery recheck....			14 5	84 0

and no tug was apparent. The liver was not enlarged. Oral temperature was 100° F.; pulse rate 90 per minute; respirations 24 per minute. Urinalysis and blood count were normal. Serological tests for syphilis revealed 4 plus Kahn and a positive Eagles' test. A repeat Wassermann was requested but not completed. Venous pressure, by direct measurement in the right antecubital vein, was 47 cm. saline. An electrocardiogram was normal. Fluoroscopy of the chest revealed an increase in the area of superior mediastinal density, convex to the right, bulging to a distance of 7 cm. from the midline in the second and third right intercostal spaces. Expansile pulsation was visible in this border. The heart appeared to be pushed downwards and to the left. The superior mediastinal mass appeared to be continuous with the upper part of the cardiac silhouette when viewed in the left anterior oblique position. These findings were confirmed later by roentgen films (see Fig. 1).

The diagnosis made on the first day of admission was superior vena caval obstruction due to aneurysm of the descending aorta. To explain the murmur, rupture of the aneurysm into the superior vena cava was considered. Positive serological tests for syphilis indicated the

SPECIAL ARTICLE
THE REMOVAL OF SUPERFLUOUS
HAIR BY X-RAYS
D. E. H. Cleveland, M.D.
Vancouver, B.C.

During the autumn and winter of 1930-31 advertisements appeared in the Vancouver daily papers, under the name of the Marton Laboratories, of which I had not heard before, offering removal of superfluous hair from the face. To any dermatologist or radiologist it was obvious from the wording that the method employed could only be x-rays. A booklet was obtained on application, which was published in the United States, in which it was stated that recent discoveries had made the use of x-rays for this purpose perfectly harmless, and the advertiser guaranteed perfect results which would be permanent. The renting of additional space in the building after a few months, and the fact that many prospective clients found that they had to wait several days for an appointment was evidence of a growing business.

I drew the attention of the Vancouver Health Department to the operations of this concern, and an investigation followed. It was learned that a regular business license had been issued by the license inspector, but the Health Department had not been consulted or informed of this. When the grave dangers to the public health were explained to him, as arising from this situation, the medical health officer became intensely interested. He infected the city license inspector with his zeal to eradicate this public nuisance and danger. Provided with a list of headings for an inquiry they made a descent upon the proprietor of the "Laboratories", in whose person was combined operator, technician and staff.

She produced no certificates or other qualifications testifying to her competency to operate x-ray apparatus. In lieu of this she stated that she had at one time been employed in a dentist's office in New Zealand, and in this office was an x-ray machine with which she admitted she had nothing to do. A woman from the United States had for some months done similar work in a local apartment hotel, gave the present proprietor two or three months' instruction, sold (leased?) her the machine and departed whence she came.

Questioned about the machine and her technique, the proprietor had no idea what voltage she was using, said the amperage was "4", the distance between tube and skin "about 6 or 8 inches", the time of exposure "about 2 or 3 minutes", the size of each area treated was "about 4 by 4½ inches"; 10 to 20 treatments at intervals at first of 1 to 10 days and later

2 to 4 weeks constituted a "course". A filter was used, the thickness and composition of which was unknown. This was the secret of a "Doctor Marton of Paris". The name of the maker of the machine could not be learned, and there was no certificate of calibration or knowledge whether it had been calibrated.

The proprietor told the investigators that the Marton Laboratories had been operating in San Francisco and elsewhere in California and also in the State of Washington with full consent and approval of health authorities there. Statements were obtained by me from the Department of Public Health of the City and County of San Francisco, and the Board of Medical Examiners of the State of California to the effect that the Tricho System—which I then presumed to be the same concern under another name—had been "run out" of San Francisco; that the Health Department had never authorized it and would prevent its use if they knew of any place where it was being installed. The Board of Medical Examiners further submitted details of actions taken by them in the State of California in this connection, where the apparatus had been sublet to various beauty-parlours, etc., in charge of inexperienced operators. Further, law-suits had already been commenced in California against these operators for damage to elastic tissue, causing wrinkling and other disfigurements.

The above facts, together with an explanation of the dangers arising from the use of x-rays for removal of superfluous hair, especially in the hands of inexperienced operators, were submitted to the City Council of Vancouver. The medical health officer informed me that as a result of this steps would be taken at once to cancel the license of the Marton Laboratories. The proprietor of the concern began calling me frequently on the telephone asking for an interview, and finally one morning a woman appeared in my waiting-room announcing that she had come from Seattle for an interview in this connection, and that she would not leave until she got one. She sat it out until mid-afternoon and then disappeared.

At this point the city solicitor intervened with the announcement that there was no city statute under which the license of the Marton Laboratories could be revoked, cancelled or otherwise interfered with for such reasons as we presented. No laws being broken so far as the city was concerned the business might go on. It did.

About this time the Marton Laboratories was absorbed by a well-known beauty parlour which now announced its new name as the Arnold Dermie Laboratories. I took the matter up with the Provincial health officer and met with the same discouraging situation. So far as the Provincial laws were concerned

the business of destroying women's skins might continue. This officer was interested enough however to suggest that the Provincial Medical Act might be concerned. The legal advisers of the College of Physicians and Surgeons of British Columbia on consultation found that in treating by x-rays to remove a blemish, i.e., superfluous hair, the Marton Laboratories or Arnold Dermic Laboratories was practising medicine within the meaning of the Act. It was only necessary to secure one or more witnesses or other tangible evidence to open a prosecution.

As the only acceptable witness would be a woman who had received treatment, or the

but questioning invariably elicited the information that they had been treated at the Marton Laboratories from one to three years earlier. It was reported to me by one young woman that "over fifty" of her fellow-employees in a large department store had received treatment at the Marton or Arnold Laboratories, and had been given a special reduced rate of \$75.00 for a course of treatment. Even allowing for exaggeration it is evident that these operations were being carried out on a wide scale.

It was considered wise to tell these patients to what they owed their trouble and to inform them that the changes in their skin were ir-



Fig. 1.—Mrs. G.R.S., radiodermatitis of cheeks, nose and chin and squamous cell carcinoma of nose following treatment with x rays for removal of superfluous hair.

Fig. 2.—Mrs. T.C.W., radiodermatitis of forearms and hands and squamous cell carcinoma right middle finger necessitating amputation following treatment with x-rays for removal of superfluous hair 17 years previously.

only evidence which would be received would be an itemized and receipted bill, prosecution was of necessity delayed. Few women will go on the stand to admit that they have been dupes of a quack. Financial transactions were on a C.O.D. basis and no receipts were given.

For months past women had been encountered in private practice complaining of dryness of the skin and showing varying degrees of erythema, early atrophy and telangiectasia on cheeks, chin, nose and neck. Few had any suspicion of the cause of their trouble,

reversible. Without dwelling upon the dangerous character of the possible sequelæ, each patient was urged to report at frequent intervals, and at once if warty growths appeared. With rare exceptions this advice has not been followed. It was apparent that many, especially those with incipient radiodermatitis, did not take the advice and comments seriously. Others, greatly upset, vigorously denounced not only the commercial firm concerned, but also the medical profession for permitting such a situation to exist. Others, "more than

CLINICAL and LABORATORY NOTES

REPLACEMENT TRANSFUSION IN ERYTHROBLASTOSIS FETALIS

(Report of 24 Cases)

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During the past decade erythroblastosis fetalis, with its clinical manifestations of progressive anaemia, jaundice, enlarged liver and spleen in the newborn has been established as due to the sensitization of maternal Rh negative blood by either a transfusion of Rh positive blood or by an Rh positive fetus.¹ Recognition of the pathogenesis of the disease has led to its treatment by transfusion with Rh

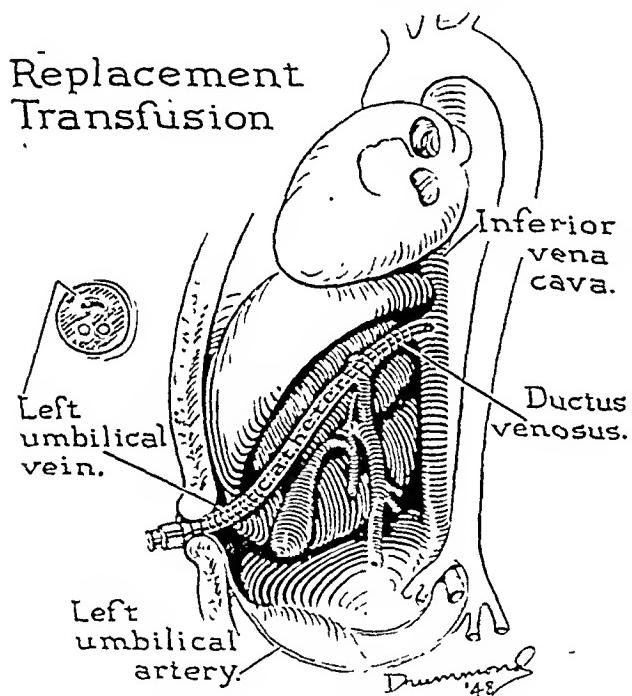


Fig. 1 illustrates the catheter in place in the umbilical vein.

negative blood. It is unlikely that Rh positive blood survives long enough to combat the anoxia which is present. Removal of the child's blood and replacement with Rh negative blood would appear to be ideal inasmuch as one might remove deleterious isoagglutinins and at the same time replace oxygen-poor erythroblasts with mature red cells. Replacement should be done soon after birth in order to lessen irreversible changes in tissue such as brain, kidney, and liver.

In the past year we have treated 24 cases by replacement transfusion, rather than repeated transfusions, in an effort to evaluate this form of therapy. Exsanguination, or replacement transfusion is not a new procedure. It was first reported from this hospital in 1921 by

Robertson, Brown and Simpson,² and again in 1925 when Hart,³ suggested its use in erythroblastosis fetalis. We have followed the lead of Diamond,⁴ and have used the umbilical vein, which remains patent several days post-partum. The procedure is simple but must be carried out with extreme care. Rh negative stored blood (as fresh as possible) in amount equal to 100 c.c. per pound of body weight should be available. The infant must be kept warm and oxygen administered almost continually. The operator should wear a stethoscope which is strapped over the infant's praecordium. The umbilical vein is catheterized with a woven venous cannula, (size 6, C. R. Bard, Inc.); 20 c.c. of blood are withdrawn from the vena cava and immediately replaced with 20 c.c. of the stored blood. This is repeated slowly allowing 5 minutes for removal and insertion of the blood until 100 c.c. per pound is replaced, leaving a positive balance of 15 c.c. per pound

TABLE I.
REPLACEMENT TRANSFUSIONS
24 CASES

Age on admission.....	1 hr. to 4 days!
Average birth weight.....	6 lb. 3 oz.
Jaundice present.....	22 cases
Enlarged liver.....	21 "
Enlarged spleen.....	21 "
Hæmoglobin on admission.....	4.2 to 16.2 gm.
Average.....	9.8 gm.
Red blood count on admission.....	1.1 to 5.3 million
Average.....	2.9 million
Patients' blood	
Rh positive.....	24 cases
Group O.....	11 "
Group A.....	8 "
Group B.....	3 "
Group AB.....	2 "
Erythroblasts in smears 13-55	
per 100 w.b.c.....	17 "
Antibodies present.....	20 "
Mothers' blood	
Rh negative.....	24 "
Antibodies.....	24 "
Fathers' blood	
Rh positive.....	24 "
History of miscarriage or stillbirth.....	14 "
Previous transfusions.....	3 "
Blood used for replacement	
Rh negative.....	24 "
Group O neutralized.....	3 "
Amount removed.....	130 to 720 c.c.
Average.....	440 c.c.
Amount replaced.....	180 to 750 c.c.
Average.....	480 c.c.
Percentage replacement.....	55 to 95%
Complications—Cardiac embarrassment requiring supportive treatment.....	5 cases with 1 death
Hæmoglobin on third day.....	9.5 to 18.1 gm.
Average.....	12.8 gm.
Supportive transfusions 50 to 150 c.c.....	18 cases
Days in hospital.....	6 to 35
Average.....	12
Deaths due to transfusions	
Cardiac failure.....	1
Deaths due to erythroblastosis.....	1
Deaths due to intestinal intoxication	
20 days postoperative.....	1

of body weight. To prevent clotting, $\frac{1}{2}$ e.e. of heparin solution (1 e.e. to 100 e.e. of saline), is used in each 20 e.e. of blood and frequent samples are taken to estimate the clotting time and percentage replacement. Great care must be exercised in both removal and replacement of blood in an infant whose total circulating blood volume is not more than 300 to 400 e.e. The appearance of a murmur, undue slowing or acceleration of the heartbeat are indications to proceed more slowly. Haste may result in cardiac embarrassment and the procedure should take from one to two hours.

In our series of 24 cases we have had 3 deaths, one from cardiac embarrassment, one from intestinal intoxication at 20 days and one from erythroblastosis fetalis of the kernicterus type. The last patient was moribund on admission and at post mortem showed brain damage associated with kernicterus.

In conclusion we suggest that replacement transfusion in the treatment of erythroblastosis fetalis has given the best results to date.

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ON THE DETECTION, DIFFERENTIATION AND TITRATION OF ANTI-RH ANTIBODIES*

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Anti-Rh antibodies occur in at least two states or forms. For the detection of the presence of one of these in a serum, red blood cells suspended in saline are ordinarily used; for the other, plasma, serum, albumen or other colloid must be added. The former are variously termed agglutinins or saline, early, immature, bivalent or thermolabile antibodies; the latter glutinins or partial, incomplete, coating, blocking, inhibiting, hyperimmune, late, mature, monovalent or thermostable antibodies. We do not know for certain how the one differs from the other, why one rather than the other develops in a given patient at a given time, or that the one kind rather than the other is more likely to produce disease.† One thing we do know about them is

* From the Children's Hospital and Department of Paediatrics, University of Manitoba Medical School, Winnipeg. Assisted by a grant from the Associate Medical Committee, National Research Council, Ottawa.

† We make these statements categorically, knowing that some investigators believe they do know these things. This paper is, however, not written as an argument but as a simple statement of practical laboratory methods found useful in a field in which there is much confusion.

this difference in the mode of demonstrating them. We have, therefore, in our laboratory come to use these qualities to designate them, naming them respectively "saline" and "albumen" since an albumen solution is the colloid we use.

Some investigators, notably Hill and Haberman,¹ have brought forward evidence for the existence of several other forms of Rh antibodies. While this may prove to be true, it has not yet been verified nor its clinical importance established, so that, for the purpose of this paper but two forms will be considered.

DETECTION OF ANTIBODIES

We have now examined the sera of nearly 4,000 Rh-negative women and, having tried various methods for the detection of antibodies, have concluded that for first demonstration the simplest is the albumen suspension method, which is included in Diamond and Denton's² paper on the use of albumen in agglutination. This will detect the presence of Rh antibodies whether saline or albumen, but will not differentiate them. In our hands it has proved as sensitive as, less time-consuming and less open to error than, that of Wiener, whether in the original form³ or its variants up to and including the current one.⁴ We have entirely given up Diamond and Abelson's⁵ slide method. While Dr. Diamond has many times demonstrated this test to one or other of us in his laboratory and there it has been clear-cut, in our own this has not always been so; on several occasions the method has failed to pick up antibodies demonstrable by other methods. We have not had an extended experience with Berlin's⁶ adaptation of our capillary method. Our present impression is that it is open to major errors, though further experience may prove us wrong. The method of Coombs, Mourant and Race⁷ we use practically only for evidence of sensitization of the cells of the newborn.

Albumen suspension method:

Materials:

1. Test tubes approximately 7.5 cm. long; inside diameter 0.8 cm.; smooth, round bottom.
2. One e.c. serological pipettes; a separate pipette for each serum.
3. Thirty per cent bovine albumen.*
4. Normal saline.
5. Red blood cells. Rh-positive and Rh-negative cells are required. They should preferably be group O, but if a single serum is being tested they may be of the same group as the serum. The cells must be fresh—not over two days old—and must be kept in a refrigerator. Our own practice is to use for our Rh-positive

* Supplied by Armour Laboratories, Armour & Co., Union Stock Yards, Chicago, Ill. We have recently made use of 25% human albumen kindly supplied by Dr. W. P. Boger of Sharpe and Dohme. This has given identical results with the bovine albumen.

cells, cells of phenotype R₁R₂,* from one donor whose blood has been found to have excellent agglutinability. The agglutinability of cells varies greatly, and can be determined by setting up parallel titrations with cells from different donors. It will be found that some give a more clear-cut and easily read reaction than others. The Rh-negative cells must be of genotype rr. It is wise to use cells from two Rh-positive and two Rh-negative donors. Just before use enough cells for one day's tests are washed three times in normal saline, and, after pouring off the last saline, enough of the washed cells added to the 30% albumen to make a 2% suspension—usually about 2 drops of the washed cells to 1 c.c. of the 30% albumen. The Rh-positive and the Rh-negative suspensions are made up separately.

6. The serum or other fluid to be tested. This must be sterile. Contaminated specimens sometimes give false positive and sometimes false negative results. The sera should also be fresh. Some sera stored in the refrigerator at approximately 4° C. retain their original titre for many months; others deteriorate in a few weeks or months. The latter is particularly true of saline antibodies. Demonstration and titration are, therefore, a record of antibody only for the day the examination was carried out, and do not necessarily represent the state of affairs at the time the serum was drawn. Every serum is examined whole and also diluted 1 in 16 with saline. The need for examining sera in dilution as well as whole, when seeking for Rh antibodies, was first pointed out by Taylor *et al.*⁵ This is true of the present albumen suspension method as it is of other methods.

Method.—For every serum to be tested number six of the small test tubes, place them in a rack and load as follows:

- Tube 1. 2 drops whole serum under test.
2 drops albumen-suspended red blood cells from Rh-positive donor No. 1.
- Tube 2. 2 drops whole serum under test.
2 drops albumen-suspended red blood cells from Rh-positive donor No. 2.
- Tube 3. 2 drops serum under test diluted 1 in 16; red blood cells as in tube 1.
- Tube 4. 2 drops serum under test diluted 1 in 16; red blood cells as in tube 2.
- Tube 5. 2 drops whole serum under test.
2 drops albumen-suspended red blood cells from Rh-negative donor No. 1.
- Tube 6. 2 drops whole serum under test.
2 drops albumen-suspended red blood cells from Rh-negative donor No. 2.

Shake the tubes vigorously; let them stand at room temperature for ten minutes, then centrifuge. The time and speed of centrifuging must be learnt by experience,—a sharp-edged button of cells in the tube, not nudely packed, is required. Using a fully loaded No. 1 S.B. International Centrifuge with rheostat at 15, two minutes from "Turn on" to "Turn off" gives good results.

To read macroscopically the tube is agitated a little and tilted almost horizontally several times.

* We will be glad to determine the phenotype of cells for other laboratories not in a position to do this themselves. For this purpose 1.0 or more c.c. of sterile, clotted blood is required.

We record the degrees of agglutination as follows:

S	Solid agglutination, a button of cells floating in clear fluid.
++++	Large, firm clumps of cells suspended in clear fluid.
+++	Moderately large clumps of cells with slightly cloudy fluid due to a small number of unagglutinated cells.
++	Small but distinct clumps with cloudy fluid. When viewed under the low power of the microscope there are several moderate-sized tight clumps of cells to each field.
+	Merest suggestion of finest dust macroscopically. Under low power there are quite a few tight clumps of two to five cells in every field.
±	Don'tful. Under low power there are groups of two, three or four cells sticking together, but no definite agglutinates.
-	No agglutination seen microscopically.

Occasionally, readings of +++±, ++±, etc., are used for intermediate reactions. Tubes read as solid, +++, +++ or ++ are not checked microscopically but all others are. A reading of ± is not considered positive. The titre of the serum is taken as the highest dilution in which it gives at least a + agglutination. For microscopic reading some of the mixture is taken on the end of a glass rod, mixed with a drop of saline on a slide, allowed to stand one to two minutes and then examined. As already stated, this method detects the presence of Rh antibodies, whether they be of the saline or of the albumen type, but does not differentiate between them. If all one wants to know is whether or not an antibody is present one need go no further. Usually one will want to know at least the strength of the antibody. Titration is carried out by diluting the test serum serially with normal saline, and proceeding as above with each dilution.

Detection and titration of saline antibody.—We have found, contrary to our earlier statement,³ that the capillary method can be used for the detection as well as for the titration of saline antibody. The reaction is precise and much easier to read than the test tube methods. The key to its successful use in detection is the thorough washing of the red cells; to give titration levels essentially identical with those obtained in the test tube, final readings are made at 60 to 75 minutes, although first agglutination may take place in 10 minutes or less in the higher strengths.

The same sort of Rh-positive cells are used as for the albumen suspension method. They are washed three times in at least twenty times their volume of normal saline, and are finally suspended in saline to give an approximately 20% suspension. (Some of the suspension is spun down in an haematoctit tube to check its

strength). The test is carried out as described for Rh typing.⁹ Titration is done by serially diluting the serum with saline, setting up each dilution with the test cells, and reading the whole at 60 to 75 minutes. The agglutinates in the endpoint capillary will be very fine.

Interpretation as to type and titre of antibody.—If one gets agglutination by the albumen suspension method it is certain that there is an Rh antibody in the serum. If one gets agglutination in the capillary under the above conditions, it is certain that there is a saline antibody present. If one gets agglutination by the albumen method and not by the capillary, there is an albumen antibody present. If one gets agglutination in both, then the type or types of antibody present can only be decided by titration. To put this briefly:

Agglutination by albumen method—Rh antibody present.

Agglutination in capillary—Rh saline antibody present.

Agglutination in albumen only—Rh albumen antibody present.

Agglutination in both—decide by titration, thus:

1. Titre in capillary and in albumen suspension identical or only one dilution apart: interpret as pure saline antibody.

2. Titre in capillary several dilutions less than in albumen suspension: interpret as two antibodies present, saline antibody of the capillary titration titre, albumen antibody of the albumen suspension titration titre. If the albumen titre is very strong, say 1:512, and the saline only demonstrable with undiluted serum, the latter may be due to a separate antibody, or possibly to an effect of the strong albumen antibody.

3. Titre in capillary more than one dilution stronger than in the albumen suspension. This occurs rarely. Probably best interpreted as pure saline antibody. These are best illustrated by actual examples:

	DILUTION										
Method.....	1	2	4	8	16	32	64	128	256	512	
Capillary.....	+	+	+	+	+	+	+	+	+	+	
Albumen.....	S	S	S	++++	++++	+++	+++	++	+	+	

Interpretation:—Saline antibody only.

	DILUTION										
Method.....	1	2	4	8	16	32	64	128	256	512	
Capillary.....	+	+	+	+	+	+	+	+	+	+	
Albumen.....	S	S	S	S	S	++++	+++	++	++	++	

Interpretation:—Saline antibody, titre 1:16
Albumen antibody, titre 1:256

	DILUTION										
Method.....	1	2	4	8	16	32	64	128	256	512	
Capillary.....	+	+	+	+	+	+++	++	+	+	+	
Albumen.....	S	S	S	++++	++++	+++	++	+	+	+	

Interpretation:—Albumen antibody, titre 1:128
Probable saline antibody, titre 1:2.

Capillary reaction may possibly be due to the albumen antibody.

	DILUTION										
Method.....	1	2	4	8	16	32	64	128	256	512	
Capillary.....	+	+	+	+	+	+++	+++	+++	+++	+++	
Albumen.....	S	S	S	S	++++	+++	++	++	++	++	

Interpretation:—Albumen antibody, titre 1:512

Saline antibody, doubtful. Reaction in capillary probably due to the albumen antibody.

Specificity of Rh antibodies.—There are, as is well known, several Rh antibodies of different specificity.¹⁰ To determine the specificity of any serum one must have available blood cells of several Rh phenotypes. Since these are available in only a few laboratories, of which ours is one, we will be glad to determine the specificity of sera for any other Canadian or American laboratory. It does not seem worth while to set out the method here.

SUMMARY

For the detection, differentiation and titration of Rh antibodies two fairly simple methods are recommended. For first detection the sera being investigated are added both whole and in a 1 in 16 dilution to suspensions of Rh-positive and whole to suspensions of Rh-negative cells in bovine albumen and, after every brief mixing and centrifuging, the sediment examined for agglutinates. For differentiation, titration is done by this method and also by using saline-suspended cells mixed with the sera in capillary tubes. The methods and interpretations are given in detail.

We gratefully acknowledge our debt to the Associate Medical Committee, National Research Council, Ottawa, for their support of the investigation upon which this report is based, and for their permission to publish this paper, and to Drs. L. K. Diamond, J. Hill and S. Haberman for supplying us with some of the rarer anti-Rh sera.

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EDITORIAL**SALT AND WATER DEPLETION**

THE Croonian Lectures delivered in London in December, 1946, by Dr. H. L. Marriott* deal exhaustively with the physiology, clinical manifestations and treatment of water and salt depletion in the human subject. These articles will be worthy of close reading but for the moment we will refer only to the sections of more direct clinical application.

The important distinction is made between dehydration, the result of water depletion, and dehydration, the result of salt depletion. The two conditions, although often associated, differ from each other in mechanism of production, symptomatology and treatment indicated. When dehydration is recognized, every effort should be made to ascertain whether it is due to salt depletion, water depletion, or a combination of both. The administration of saline solution to patients suffering from "pure" water depletion makes them worse and may be fatal. On the other hand, an essential condition in the causation and aggravation of "pure" salt depletion is a liberal intake of unsalted water. If salt depletion goes unrecognized and terminates fatally, the death may be ascribed to "toxæmia", "uræmia" or "circulatory failure".

Salt depletion almost always arises from excessive losses of sodium chloride in sweat, in intestinal secretions (vomiting; diarrhoea; prolonged gastric or intestinal suction; biliary, intestinal, or pancreatic fistulae), or, in Addison's disease, in the urine. Rarely in temperate climates is the salt intake so low that the body's power of salt conservation is unable to maintain the salt balance of a healthy person. Symptoms of pure salt depletion include lassitude, muscular weakness, headache, anorexia, orthostatic giddiness and fainting, muscular cramps, nausea, vomiting, apathy, and mental confusion and delusions. Weight is lost and the patient appears dehydrated. The plasma volume drops and haemoconcentration occurs. The blood vis-

cosity is increased. The plasma sodium and chloride fall and the urea rises. When there is disproportionate loss of sodium chloride ions—such as the predominant loss of sodium in diarrhoea and of chlorine in vomiting—the acid-base equilibrium may be shifted into either an acidosis or an alkalosis. Terminal, the blood pressure drops and the clinical picture is one of peripheral circulatory failure (oligæmic vasoconstrictive shock). In the last stages of depletion, a 70 kg. man may have a deficit of 6 to 10 litres of isotonic saline. Of special importance from the diagnostic standpoint are the following observations: (1) pure salt depletion, in distinction to pure water depletion, is *not* accompanied by thirst; (2) in patients with pure salt depletion the urine volume remains normal till late; (3) except in patients with Addison's disease, chlorides disappear from the urine early in the course of salt depletion.

Dr. Marriott emphasizes that for the successful treatment of salt depletion, not only must its presence be recognized, but an estimate must be made of its degree at the outset of treatment, and its progress during the course of treatment. As a general rule the severity of the symptoms and the presence or absence of chlorides in the urine (except in patients with Addison's disease) form a better guide to treatment than determinations of blood constituents. Isotonic saline solution (0.85%) should be given until symptoms are relieved and chlorides are consistently present in the urine. Thereafter hypotonic saline (isotonic saline plus 5% glucose solution) should be given. Hypotonic saline is recommended for use throughout the treatment of mixed salt and water depletion and for the treatment of infants. Initially, if symptoms are severe, the intravenous route should be employed. Apparently fluids are retained in the stomach for a long time in severe salt depletion and, if vomiting occurs, aspiration of the vomitus may lead to pulmonary complications. The amount of fluid given should be sufficient to restore the patient to a normal state of balance. The equivalent of 10 litres of saline or more may be required for an adult severely depleted. A good objective to work for in the treatment of an adult is a urine volume of not less than a pint (570 ml.) with a salt content of 3 to 5 g. per litre per 8 hour period. It is pointed out that during the intravenous administration of saline some sodium chloride may

* Brit. M. J., 4493 (Feb. 15), 245; 4496 (March 8), 285; 4497 (March 15), 325, 1947.

spill into the urine even though the patient is still grossly salt deficient. In emergencies, intravenous injections of saline should be given rapidly: the first pint in 10 minutes; the second in 15 minutes; the third in 20 minutes; the fourth in 30 minutes; then a pint every 2 hours. Watch must be kept for signs of oedema, especially pulmonary oedema. Serious consequences may result from the administration of potassium salts or of copious amounts of unsalted water to patients depleted of sodium chloride.

The commonest clinical causes of pure water depletion are great weakness with disinclination to make the effort required for drinking, coma, and dysphagia due to oesophageal disease. Thirst and dry mouth are early and progressive symptoms. Later appear oliguria, weakness, an ill dehydrated appearance, slight personality changes, and, finally, marked impairment of mental and physical capacity; 15% of the body weight may be lost before death. The biochemical and circulatory changes do not appear so early nor do they tend to be as profound in water depletion as in salt depletion. The biochemical changes also differ qualitatively. The plasma and chloride may be elevated and, sodium and chloride continue to be excreted in the urine. In treatment, water can usually be administered by mouth or rectum. It is rapidly absorbed from the gastro-intestinal tract. If a parenteral route is necessary 5% glucose solution should be employed. The urine volume is the best indication of the amount of water required. The same objective should be sought as in cases of salt or mixed salt and water depletion, *viz.*, a pint of urine containing 0.3 to 0.5% sodium chloride per 8 hour period. The transnasal intragastric drip method of administering fluid is recommended for use in suitable circumstances.

Special care must be taken of patients who have water or salt depletion or both and are suffering from the effects of acute haemorrhage, anaemia, hypoproteinaemia, capillary damage from anoxia or toxæmia, or damaged kidneys unable to secrete salt normally. Preliminary treatment with transfusions of blood or plasma, or concomitant treatment with oxygen or both may be required. Watch should be maintained most intently for the development of pulmonary oedema in patients of this kind. The author points out some of the peculiarities of renal function in infants and emphasizes that infants are particularly susceptible to dehydration and

also, to superhydration due to too vigorous fluid therapy. Children are therefore, another group of patients deserving of most careful investigation and thought before and during fluid therapy.

EDITORIAL COMMENT

Snoring

There is almost no serious literature on snoring and yet few of the minor afflictions of mankind can be so hopelessly infuriating, even to the point of tragedy. Marriages may be broken up, and camping parties may be ruined by snoring. Can tragedy go deeper?

A recent study by Ian G. Robin (*Proc. of Roy. Soc. of Med.*, 41: 151, 1948) shows that snoring may involve various structures in the respiratory tract, but these do not all necessarily take part in the noise. It is only in comparatively few people that to the ordinary rumble there is added the weird accompaniment of wheezing and whistling which presents such possibilities in humorous burlesque. These extra sounds are produced by the epiglottis, the tongue, cheeks, lips or nostrils. The present study however is concerned only with the sounds produced by vibrations in the soft palate and posterior faucial pillars. It has been proved by means of a pharyngoscope that the snore is produced by vibration of the thin edge or *velum* of the posterior faucial pillar. A reservoir of air in the nasopharynx is necessary. When a "critical point" or position is reached in the relative position of the tongue and soft palate, the velum vibrates. But in addition to the position, the production of the snore depends on the texture of the velum, which again is affected by the muscle tone of the glossopharyngeal arch and the thickness of the tissues, especially the mucosa. The position of the tongue has a part in the "critical moment". Sleeping on the back tends to produce snoring because the tongue falls back more readily then. Dentures seem to play very little part either way.

It is the tone of the musculature which appears to be the most important single factor. But just what produces alterations in this tone during sleep is still open to question. One theory is that there is a fall in adrenal secretion during sleep leading to a lowered tone of the palatal structures. Some lay stress on the psychological aspect, even to the point of suggesting that snoring is aggravated by worry. But at least some snorers are equally bad at all times. Snoring occurs mainly in mouth breathing, so that any nasal obstruction should tend to cause it, but all mouth breathers do not snore. Still, removal of nasal obstruction is helpful, as is also change of position. For those who will tolerate it a cotton reel sewn into the back of

the pyjamas is efficacious. Amputation of the uvula very seldom gives any relief, though it may change the pitch of the snore. Keeping the mouth closed by a special splint (the Andresen) or even by adhesive, is very helpful. Altering the texture of the pillars by sclerosing injections has been tried, but with only equivocal results. Possibly tonsillectomy helps by leaving a fixed fibrous band instead of soft mobile tissues.

When all is said, snoring is a symptom of unbalanced breathing which may be accompanied by either pathological or physiological conditions. The remedy must therefore fit the causes. Isolation may be the only effective measure.

MEN and BOOKS

ABRAHAM GESNER, M.D.,
SURGEON GEOLOGIST, 1797-1864*

Kenneth A. MacKenzie, M.D.
Halifax, N.S.

This is the story of a country doctor who practised in Nova Scotia over a century ago. His name has now a permanent place in the archives of the Maritime Province due to his work in geology which led him to invent a method of distilling an illuminating oil from coal. He practised medicine for twelve years while pursuing his hobby and it is fitting that we should place in our archives some record of his career and achievements.

Abraham Gesner was born at Cornwallis, Kings Co., Nova Scotia, in 1797. His father, Colonel Henry Gesner, a United Empire Loyalist, fought in the Revolutionary War; lost all of his worldly possessions; then moved to Canada where he was given a grant of four hundred acres of land in the Annapolis Valley. He married a Miss Pineo, and Abraham was their sixth child of a family of twelve. Abraham married Henrietta, daughter of Dr. Isaac Webster, of Kentville, and had eleven children, some of whom attained eminence in the learned professions—medicine, geology and theology. As a young man Gesner shared in a venture to sell horses in the West Indies. Two of his ships were wrecked, one at Brier Island where he almost lost his life by drowning. Later, he proceeded to London where he studied medicine and surgery, at St. Bartholomew's and Guy's Hospitals, under distinguished teachers including Sir Astley Cooper and John Abernethy.

PARRSBOROUGH PERIOD, 1824-1837

In 1824, Dr. Gesner returned to Nova Scotia and settled in Parrsborough, one of the most

picturesque and interesting localities in the Maritimes. He gives one reason for his choice of location, "that there was an abundance of rocks and minerals to be studied during his leisure hours".

Gesner's medical work is completely overshadowed by his work on natural history, especially geology. Unfortunately he has left no record of his medical activities. A brief reference may be made here to the conditions of medical practice of his time and to the physiography of the district in which he did his pioneer work. It was before the days of anaesthesia and antiseptics, and there was no clinical thermometer. Medical practice consisted of simple diagnoses, empirical remedies, minor surgery, including fractures, extraction of teeth, and the management of difficult labour, when the midwife failed. The physician had ample time for indulging in "hobbies", if so minded, and golf had not appeared to divert the busy doctor from more useful forms of recreation. To visit his patients he either walked, or rode on horseback. Carriages were not known in his district. Railroads had not yet been built; country roads were little more than footpaths. One can picture Dr. Gesner visiting his patients on horseback with his saddlebag full of empirical remedies, probably home-made, and returning home with a saddlebag full of rocks and fossils.

The common illuminant for the home was the tallow candle, home-made, and "dips" made from seal oil, whale oil or vegetable oils. Dr. Gesner burnt the "tallow candle" instead of the "midnight oil".

The physiography of this district is one of the most interesting in the world. Parrsborough, then only a village, situated at the mouth of a river flowing into the Bay of Fundy, was flanked by beautifully wooded hills and magnificent cliffs. Opposite the village, across Minus channel nine miles away, arose the majestic headland of Blomidon. The Bay of Fundy is noted for its remarkable tides which rise and fall forty to fifty feet twice daily. The movement of huge bodies of water produce treacherous currents and constant erosions make fresh exposures of rock for hundreds of miles. This magnificent panorama of cliffs has been a source of pleasure to travellers and lovers of nature, and a nightmare to mariners, many of whom have been ship-wrecked on the treacherous coast line. Even the Indians were intrigued by the grandeur of the district and built up legends about the abode and activities of their gods. The legend of Glooscap is a familiar feature of Indian lore. To Gesner, however, these cliffs made a different appeal. In few places in the world have the pages of geological history been so beautifully and wonderfully exposed, and Gesner, the lover of nature, made the most of his opportunities. On the shore of his village he could pick up

* Read at the Seventy-ninth Annual Meeting of the Canadian Medical Association, Section of Historical Medicine, Toronto, June 25, 1948.

amethysts, opals, carnelian, agates, jasper, and other minerals from the trap rock—volcanic in origin—which had at some time pushed through the triassic sandstone. Every headland, gully and river bed for miles around was a fruitful field for the amateur geologist. Some miles away he studied the strata of the Carboniferous Period along the famous Joggins shore. For thirty miles along this shore may be seen seventy seams of coal separated by beds of sandstone, shale and slate, representing a thickness of ten miles. On the shore one finds magnificent fossils, giant trees, lepidodendra, cycads, ferns, calamites and sigillaria, many of which have found their way to, and may now be seen in many museums of North America and Europe.

Dr. Gesner practised for twelve years in this district and, as far as we know, his practice was his only source of income. During his leisure hours he explored the whole district, at first near his home, later in more remote parts of the country. He kept careful notes of his findings, and in 1836 he was able to complete a book which was published in Halifax by Gossip and Coade. It was entitled "Remarks on the Geology and Mineralogy of Nova Scotia", by Abraham Gesner, Surgeon. In his preface he apologizes for the imperfections in his work by stating, "that it has not been prepared with leisure and retirement. On the contrary, amidst the arduous duties of a laborious profession and under the annoyance of perpetual interruption, most of the pages have been written; or during the silent hour of midnight when the labour but not the fatigue of the day had departed". This statement indicated that he was still a busy practitioner. At this point, it should be noted that Dr. Gesner did this work alone. Geology was in its infancy. Darwin's work did not appear until thirty years later. The hypothesis of the Ice Age had not yet been advanced. Gesner, reputed to be a religious man, must have had many struggles to reconcile the evidence of his eyes with the biblical accounts of creation and the flood. One may surmise that he had many arguments with the theologians of his day.

SAINT JOHN PERIOD, 1838-1843

Gesner's book attracted immediate attention and brought him before the public as a geologist. In 1837, he explored certain regions in New Brunswick—Grand Lake, Salmon River and Richibucto. The following year he was appointed Provincial Geologist for New Brunswick, a position which he held for three years. He made three annual reports which are preserved. At the end of this period he wished to continue his explorations but the Legislature did not see their way clear to continue his services and he was stranded in Saint John without funds. At this time he was the possessor of a large natural history collection.

said to number 4,000 specimens. Most of these were gathered in Nova Scotia while he was still in medical practice. They included animals, birds, reptiles, fish, Indian relics, as well as minerals, rocks, and fossils. He attempted to interest the Government in the formation of a museum but met with no success. He had an exhibition of his collection in Halifax, in 1841, and in Saint John, in 1842. His next move was to open a private museum in Saint John hoping that the admission fees would cover the expenses. He obtained a suitable room in the building of the Meehanie's Institute, issued a prospectus and prepared a catalogue. He was, by this time, hopelessly in debt, having borrowed money from prominent citizens of Saint John. He tried to sell his collection but found no buyers. Finally, his creditors agreed to accept his collection in payment. The Gesner museum was the first Natural History Museum in Canada, 1842, and was the nucleus of the present New Brunswick Museum which contains many of Dr. Gesner's original specimens.

In 1843, he returned to Nova Scotia and resumed medical practice at his old home, Cornwallis. He continued to write extensively on the natural resources of the Maritime Provinces, and carried out experiments on coal gas and coal oil which led him to fame.

KEROSENE PERIOD, 1846-1863

Gesner's important invention was a retort which enabled him to distil an oil from coal. The probable date of his earliest experiments is 1846 and the special type of coal used was Albertite found in New Brunswick; the patents were taken out some years later. In 1850, Gesner met at Halifax the Commander-in-chief of the British North American Station, Lord Dundonald, who is said to be the original discoverer of illuminating gas. He had a commission from the British Government to inquire into the possibilities of producing fertilizer from the asphalt deposits in Trinidad, for the coffee and sugar plantations of the West Indies and Gesner was employed to assist him. This gave Gesner an opportunity to continue his oil researches with asphalt. The oil which he was able to produce from asphalt, and various types of coal, was a clear oily liquid which proved to have better illuminating properties than the gases already in use. Gesner coined the word "kerosene". At first he called it "Keroselain", from two Greek words meaning "wax" and "oil" and later contracted it to kerosene. He formed a company in Halifax which did not prove to be a success. In 1853, he went to New York, took out patent rights and sold them to the New York Kerosene Company. He remained there for ten years taking an active part in the construction of an oil plant at Hunter's Point, N.Y. The old Gesner refinery is still in existence, the

property of the Standard Oil Company. Discovery of natural oil wells in Pennsylvania, in 1859, produced cheaper oil and interfered seriously with the New York industry. In 1863, Gesner sold his interests and returned to Halifax to take the chair of Natural History at Dalhousie University. He died the following year, 1864.

This remarkable man's activities covered a wide field. He was in turn a farmer, trader, surgeon, geologist, author, inventor, manufacturer and lecturer. His writings covered a wider field than geology, he wrote on the fauna and flora of the country and was especially interested in the commercial possibilities of the natural resources. While in his earlier years he toiled alone, in later life he made contacts with distinguished men. In 1842, he conducted Sir Charles Lyell and J. W. Dawson along the Joggins shore. In 1840, he was made a Fellow of the Royal Geological Society of London. Later he was made a corresponding member of the Geological Society of Canada, Academy of

Natural Sciences of Philadelphia, and the Geographic Society of New York.

In one of Dr. Gesner's papers he refers to the natural philosopher in the following prophetic words:

"Although he may toil in silence, and remain unknown, and may not receive the least encouragement among his labours, or reward for his pains, yet, when he disappears he leaves something in the hands of his successors that may administer to their wants, and render them wiser and happier."

For seventy years Gesner's grave was unmarked, known only to the caretaker of Camp Hill Cemetery. In 1933, the Imperial Oil Company, erected a fine black granite shaft to "Abraham Gesner, M.D., the inventor of Kerosene Oil". The following is from *Imperial Oil Review*, June, 1933:

"Although the process invented by Dr. Gesner is in use today with certain mechanical improvements, he himself reaped little benefit and until the Curator of the Nova Scotia Museum called attention to his unmarked grave, he has been practically a forgotten man. As a

Fine Art and Camera Salon, Toronto, 1948



"County Cottage". By Dr. Adrian Anglin, Toronto. One of the prize-winning oil paintings.

[Sponsorship of Messrs. Frank W. Horner, Ltd., Montreal]

tribute to his achievements and in gratitude to one whose work has meant so much to one of the world's greatest industries, Imperial Oil Limited has donated a sum of money to be spent on a suitable monument which will be erected to Dr. Gesner."

In collaboration with the Nova Scotia Historical Society and Nova Scotia Institute of Science the monument was erected in 1933, to a man who started life as a country doctor, sacrificed his material interests for his love of science, experienced the pangs of poverty and shattered hopes, and died poor. Yet, his invention has brought wealth to many and light and comfort to millions of homes.

MEDICAL SOCIETIES

The Canadian Rheumatism Association

The annual meeting of the Canadian Rheumatism Association was held in Toronto on June 22, 1948. The morning session, at Sunnybrook Hospital, opened with a business meeting of the Executive Committee, followed by a discussion of the problem of Ankylosing Spondylitis and a presentation of a variety of clinical cases by the staff of the Arthritis Centre of Sunnybrook Hospital.

Following a luncheon at Sunnybrook Hospital, the afternoon session was held at the Royal York Hotel where the program comprised the following presentations: (1) "Denervation of Hip Joints", Dr. R. I. Harris, Toronto; (2) "Report of Investigation of Hyaluronidase Inhibitors in the Serum of Patients with Rheumatic Disease", Dr. Hugh Starkey and Dr. Lyon Lapin, Montreal; (3) "Some Aspects of Rheumatic Treatment in Great Britain", Dr. H. S. Robinson, Banff, Alberta; (4) "Some Observations on Nutrition and Protein Metabolism in Rheumatoid Arthritis", Dr. Victor Schencker and Dr. L. G. Johnson, Montreal; (5) "Milkman Syndrome", Dr. J. A. Blais, Montreal; (6) Remarks by Dr. Philip S. Hench, Rochester, Minnesota; (7) Motion Picture by Dr. W. S. Barnhart, Ottawa.

Dr. Philip S. Hench, of the Mayo Clinic, Rochester, Minnesota, was made the first honorary member of the Canadian Rheumatism Association in recognition of his extraordinary contributions to the objects of this organization.

The following officers were elected for the term of 1948-1949: President—Dr. Henry P. Wright, Montreal; First Vice-president—Dr. A. W. Bagnall, Vancouver; Second Vice-president—Dr. W. S. Barnhart, Ottawa; Secretary-Treasurer—Dr. Donald C. Graham, Toronto.

CANADIAN ARMED FORCES

News of the Medical Services

The annual meeting of the Defence Medical Association of Canada is being held at the Chateau Laurier, Ottawa, on November 4, 5 and 6, 1948, under the chairmanship of the President, Colonel L. H. Leeson, O.B.E., of Vancouver, B.C. The provincial branches are each sending delegates, but the executive wishes it made known that the meeting is open to all members, and hopes for a large attendance. The annual dinner takes place on Friday evening, November 5.

The Association was founded in 1892 and has since held central meetings in various Canadian cities once

and sometimes twice annually except during and immediately following the two World Wars, when most of the members were on active service. Its function is to consider all medical problems affecting the Armed Forces, and it has lent much good counsel and faithful support to the Medical Services. Membership is drawn from medical officers and retired medical officers of the Navy, Army and Air Force.

Dr. J. Paul Laplante, Ste. Anne's Hospital, Ste. Anne de Bellevue, Quebec is the Honorary Secretary-Treasurer.

The first and second year medical cadets of the Canadian Officers Training Corps took part in exercise "Hippocrates II" at Meaford, Ont., on August 7, 8 and 9, 1948. The officer cadets and the directing staff from the R.C.A.M.C. School proceeded from Camp Borden to the Meaford Tank Range in convoy on the morning of Saturday, August 7. The first year cadets acted as combatant troops, those of the second year as medical personnel. The use of smoke bombs and blank ammunition gave the scheme a decided air of actuality. The second year students had an opportunity of testing their teaching in the establishment and moving of Regimental Aid Posts and Casualty Collecting Posts. The final siting of the C.C.P. in an abandoned farmhouse was realistic enough to recall wartime scenes to veteran medical officers. Brigadier W. L. Coke, O.B.E., Director General of Medical Services, Canadian Army, was present throughout the exercise, and spoke to the cadets at the conclusion, complimenting them upon their enthusiasm and efficiency.

Four Reserve Force field ambulance commanders arrived at Camp Borden on August 11, 1948, for a three-day visit at the R.C.A.M.C. School. As the School offers courses to members of the Reserve Force as well as to the Active Force and the C.O.T.C. the visitors were particularly interested in observing the training methods and materials which are now in use. The officers were: Lieut.-Col. R. A. Hicks, 8 Fd. Amb., Calgary; Lieut.-Col. R. A. Gordon, 7 Fd. Amb., Toronto; Lieut.-Col. C. R. Stephen, 9 Fd. Amb., Montreal and Lieut.-Col. J. H. Shaw, 21 Fd. Amb., Charlottetown.

S./L. E. O. Campbell has been transferred from the Institute of Aviation Medicine, Toronto, as Senior Medical Officer, R.C.A.F. Station, Goose Bay.

SPECIAL CORRESPONDENCE

The London Letter
(From our own correspondent)

INDEPENDENT DOCTORS

Throughout the later stages of the negotiations preceding the introduction of the national health service the veteran Lord Horder became the unofficial leader of the not inconsiderable section of the profession who were opposed to accepting the final compromise. He has now been largely instrumental in setting up an informal committee with a view to sounding the profession as to whether there is any support for the view that a professional organization should be formed for those doctors who do not wish to take part in the new service. In a statement to the press Lord Horder, who is a member of the council of the British Medical Association, has said that "there is no intention of opposing the British Medical Association, but rather of seeing that the British Medical Association does not in the future give way on any vital points". What he is anxious about is that, "should the Ministry of Health turn the screw, economically or otherwise", there should be

The pyramidal tracts are non-medullated, and presumably not functioning, which rules out the forebrain as an aid to localizing the trouble. The fontanelle may be bulging in cases of gross hemorrhage or in cerebral oedema, but may appear completely normal where the hemorrhage is small or localized infratentorially. It is a sound policy to treat every case of asphyxia as an intracranial hemorrhage until proved to be otherwise. The birth history is often of great assistance in making a diagnosis. The infant may show coma or drowsiness and refuse to suck, or may be extremely restless and irritable with a "cephalic" cry, and a tense, terrified expression. Vomiting for no apparent reason is sometimes a symptom. A slow pulse and rapid, shallow breathing, combined sometimes with thermolability, lethargy, coma or cyanotic attacks may be associated, with hemorrhages involving the medullary area.

P. J. KEARNS

Acute Rheumatism in Pregnancy. McKeown, F.: *J. Obst. & Gyn. Brit. Emp.*, 55: 50, 1948.

Rheumatic heart disease, even in its severest form, may occur subclinically. Rerudescences of rheumatic fever during pregnancy in a patient with a known cardiac lesion may not infrequently be the factor responsible for cardiac defeat. The patient with active rheumatic carditis may die quite suddenly following delivery, the condition simulating acute obstetric shock.

P. J. KEARNS

A Benign Tumour of the Placenta. Davies, D. V.: *J. Obst. & Gyn. Brit. Emp.*, 55: 44, 1948.

A haemangioblastoma of the placenta is described. The view is advanced that these arise early, from angioblastic strands which take on unrestricted growth and may or may not completely lose their continuity with the primitive angioblastic network, or, having lost this continuity, may fail in part or wholly to re-establish it.

P. J. KEARNS

Gross Hypertrophy of the Pregnant Uterine Cervix Simulating Cancer. Hill, A.: *J. Obst. & Gyn. Brit. Emp.*, 55: 31, 1948.

A case is described of a multigravida, aged 26 years, in whom gross hypertrophy of the uterine cervix with blood-stained discharge led to an erroneous diagnosis of cancer in the 37th week of pregnancy. Immediate Cesarean section produced a healthy child and rapid healing of the cervix following a puerperal course of sulfathiazole was noted. Equivocal biopsy-findings are recorded and the facts regarding cervical cancer in pregnancy are summarized.

P. J. KEARNS

Arachnodactylia. Dorrance, T. O.: *J. Pediatrics*, 31: 679, 1947.

Arachnodactylia, or Marfan's syndrome, is characterized by a congenital symmetrical malformation of the extremities consisting of considerable elongation and attenuation of the bones, more pronounced in the distal parts. The etiology is not known, however; one theory is that it is a fault in the mesodermal cells of the embryo. One-third of the reported cases are hereditary and familial.

Clinically, the syndrome seems to be allied to amyotonia congenita. There is marked atrophy of the entire musculature, especially the extremities. The subcutaneous fat is diminished in amount. The bones of the hands and feet are increased in length. Abnormalities of the skull, usually towards dolichocephaly, are present in about 80% of cases. Bilateral abnormalities of the eyes occur in over half of the cases. Luxation of subluxation of the lens is the most frequent abnormality. Congenital heart disease has been noted in about a third of the cases. There is no satisfactory treatment. There is a low resistance to respiratory infection and, as a result, few of the children reach maturity. A case is presented with the typical features.

PRESTON ROBB

Pædiatrics

Reablement of Children with Infantile Cerebral Palsy. Collis, E.: *The Lancet*, 253: 239, 1947.

Cerebral palsy is a dysfunction of movement due to a cerebral lesion interfering with one or more of the several pathways directly concerned with normal human movements. The outstanding characteristic of infantile cerebral palsy is imperfect motor control due to cerebral damage inflicted on a growing organism. The appearance and behaviour of these patients often lead to an inaccurate diagnosis and subsequent mistreatment of the child until he fits his diagnosis and becomes mentally and physically incompetent. Damage may, however, be so slight that it is undetected and motor disability passes for clumsiness, laziness or mild mental defect where the handicap is hidden, e.g., athetosis of the extra-ocular muscles or partial deafness. It is important in handling these cases to classify them properly. They have been divided into 5 types, spastic, athetoid, ataxic, rigid and tremor. At the Queen Mary's Hospital for Children the child is admitted for a probationary period into a treatment unit to allow proper classification and conditioning to his environment. Assessment of the total handicap, as far as present permits, is made as follows: (1) Functional ability. (2) Nutrition and appearance. (3) Etiology. (4) Classification into any one of the 5 motor groups already named. (5) Analysis of specific disability. (6) The dominant handedness, and (7) the mentality. As soon as the patient is properly classified training is instituted as follows, all measures overlapping to form a whole rehabilitation scheme. (1) Physiotherapy; (2) every day activities; (3) occupational therapy; (4) speech therapy; and (5), school or kindergarten work. A rounded program is worked out which covers all aspects of the patient's need. The author points out the necessity for early care by people properly trained in this field. They feel that contrary to some opinion training of these patients is very worthwhile. Physiotherapy is based on the concept that in spasticity the lesion is pyramidal whereas in athetosis the lesion is extrapyramidal; the damage to the cortex leads to a type of motor dysfunction which differs essentially from that due to a basal damage. It was felt that dural lesions are actually rare though commonly children are thought to have a dural lesion and that tension athetosis is commonly diagnosed as spasticity. Mechanical aids are introduced only to be discarded as progress is made. These include skis for walking, individually adapted chairs and tables, wooden-handled spoons and so on.

PRESTON ROBB

Nature and Treatment of Stuttering. Glasner, P. J.: *Am. J. Dis. Child.*, 74: 218, 1947.

Stuttering has its essential origin in early childhood, usually between the ages of 2 and 4 and is a manifestation of some emotional disturbance. Unless the physician becomes familiar with the causes and nature of stuttering, it will be impossible to reduce the incidence of this condition which afflicts approximately 1% of the population. Contrary to earlier beliefs, it has been found that the causes of stuttering are of a functional or psychogenic nature rather than of physical origin. Any condition or situation which can produce disturbances of a behavioral or emotional nature in children may precipitate stuttering. As a rule, the causative factors are multiple. Conditions which create feelings of unrest, insecurity or tension may bring on the condition.

Some of the factors are: (1) Overstimulation or pampering, particularly in homes where more than two adults are present. (2) Overconcern about eating, on the part of the parents. (3) Inhibition of the freedom and relaxation essential to the child's well-being, by an overprotective mother. (4) Inconsistency of treatment by the mother and by the father. (5) Overconcern over

the normal repetition of children by parents who stuttered or had relatives who stuttered. (6) Feelings of insecurity based on quarreling between parents and fear of pending separation. (7) Insecurity based on frequent changes of residence. (8) Confusion and tension on part of child due to overfrequent correction by parents or errors of articulation, pronunciation or grammatical construction. (9) Feelings of insecurity produced in an older child by improper handling after the birth of a sibling. (10) Sibling rivalry.

Stuttering, unlike many other disorders of childhood, becomes progressively worse as time goes on if the causes are not removed. Sooner or later there develops a feeling of expectancy to stuttering and he will invariably stutter again in these situations. He seems to acquire a "conditioned response". Treatment should be based on the results of careful examination, which takes into consideration such factors as causes, age, personality, present environment, attitudes, emotional problems and, of course, symptoms. Treatment should be individual and one should treat the individual as a whole. Since stuttering can have such far-reaching effects on the emotional, social, educational and vocational life of a person, it is imperative that treatment be initiated as soon as it is indicated. PRESTON ROBB

Industrial Medicine

Communication Between People in Industry. Radcliffe, R. A. C.: *Indust. Welfare & Personnel Management*, 30: 46, 1948.

One of the most important and difficult problems in industrial management today is the improvement of management-employee relationships. The author of this article presents a broad outline of the problem as a whole and draws attention to the various means by which mutual understanding, with full co-operation between management and men, can be arrived at. It is his contention that men must be given not only an understanding of what is being done, but a real feeling that their point of view and their interests really matter. Under the headings of verbal, written and visual methods of communication, he discusses the various ways by which the problem can be solved. The advantages and limitations of each method are considered together with ways of combining the methods. Certain general rules applicable to all three methods include the following: (1) The meaning must be expressed in a way which can be understood by everyone and in a way which will evoke the right response. (2) Management must have a clear knowledge of what the workers want to know, and what they, i.e., the management, wish to tell them. (3) Too many ideas should not be presented at once.

The main methods of verbal communication discussed are: informal talk, interview, speech, committee meetings and discussion groups. The great advantage of verbal methods over written, is the personal contact established between speaker and audience.

In the author's opinion written communications are difficult to do well; the best written ones can rarely be as effective as good verbal ones. The principle methods are: employee handbooks, works magazines or bulletins, notices, suggestion schemes and annual reports and accounts. The rôle of each is discussed. In all, simple words which have no double meanings, and short sentences, are essential. Wherever possible, visual aids should be used to illustrate both verbal and written communications. The most important are posters, pictures, films and exhibitions. The author stresses the importance of every firm constantly learning through experiment and observation, any new techniques which are developing. Much skill and knowledge is required to balance the right method of communication with the right manner, the right moment and the right audience.

MARGARET H. WILTON

Allergic Problems of the Railway Surgeon. Feinberg, S. M.: *Indust. Med.*, 17: 91, 1948.

In this article the author presents the problem of allergy as it concerns the railway surgeon and indicates the necessity for him to apply the principles of allergy in his practice. After a brief review of allergic manifestations which constitute major problems, specific substances responsible for allergic reactions, diagnosis of allergy, and principles of treatment, the allergic problems within the sphere of the responsibilities of the railway surgeon are discussed as they fall into three main categories. These categories are: (1) non-occupational allergy among employees; (2) occupational allergy; (3) allergy relating to passengers and public.

As 5 to 10% of the population are allergic, allergy not due to occupational factors, among railway employees, is quite common. These allergic ailments are important as they may affect efficiency and alertness. They must be considered in the pre-employment examination, particularly in determining the job classification. Furthermore the asthma or hay fever of an employee may necessitate changing his job from outdoors to indoors, or from railway station to city office. A number of specific allergens are encountered in the railway industry. Among occupational inhalants causing allergy are flour and grain dust in freight handlers, and upholstery dust in porters. Such allergens as pollen and mould spores, although not truly occupational, present a definite problem to the outdoor railway worker. A freight handler may encounter many substances that produce contact dermatitis. The importance of coal smoke is stressed. To any employee with a known respiratory allergy, the inhalation of coal smoke will present a serious hazard. Such persons should avoid jobs which expose them intimately to such atmospheres. From the standpoint of the public also, coal smoke is the most prolific source of annoyance among allergic individuals. The opinion is expressed that a great deal of the asthma and rhinitis which people experience in the city is due to the coal smoke from the railway and other industries.

The large number of allergic travellers constitutes a large-scale travel problem. In this connection the author makes certain suggestions regarding conditions on trains. For those persons allergic to dust and feathers, the provision of two or three sets of mattresses and pillows enclosed in dust-proof casings would provide comfort; for individuals allergic to certain foods, simple modifications of diets, particularly wheat, egg, and milk-free diets, could be offered. Such innovations would gain deserving publicity for those railway lines providing them.

MARGARET H. WILTON

OBITUARIES

Dr. Matthew George Burris died in Dartmouth, N.S., on August 18. He was 61 years of age. Born at Upper Musquodoboit, February 28, 1887, he attended Truro Academy, continuing his studies at Dalhousie University, where he obtained his B.A. degree in 1907. He graduated in medicine from Dalhousie in 1911. Upon graduation, he practised for a short time at Kamloops, B.C., returning east in 1912 to establish his practice in Dartmouth.

A valued member of the congregation of St. James United Church, Dr. Burris had an intense interest in town affairs, was a charter member of the Dartmouth Memorial Hospital Fund, and he served on its Board of Directors since the fund's inception. Keenly interested in sports, he was a member of the Brightwood Golf Clb. During his college days he was star member and team captain of the glorious Dalhousie senior rugby team of 1909, which was one of the greatest teams in the history of the University.

A member of the Nova Scotia Historical Society, he travelled extensively in the province, taking a keen

interest in its history, writing many short stories based on Nova Scotia lore. He was a former president of the Halifax Medical Society, a member of the Nova Scotia Medical Society and of the Canadian Medical Association. He is survived by his widow, one daughter, two brothers and four sisters.

Dr. Manuel Gorin de Souza, physician and surgeon, died August 6 at his home in Toronto. Dr. de Souza had practised in Toronto for 23 years. He was born in British Guiana and graduated from the University of Toronto in 1924. He took post-graduate work in New York. He was a member of St. Anthony's church and the Catholic Order of Foresters.

He is survived by his widow and two sons.

Dr. Edward J. Finnerty, aged 59, former resident of Toronto, died July 14, in Sonora, Calif. Born in Toronto, he attended St. Michael's college where he graduated in medicine in 1911. He practised at Henley, Sask., for 15 years, and moved to southern California where he was chief of staff at Eldridge state hospital. He is survived by his widow, two daughters and a son.

Dr. Mervyl Homer Winifred Fizzell, aged 61, staff member of the Colaet Belcher Hospital, Calgary, died recently at his home of a heart attack. Graduate of Queen's University, he practised in Saskatchewan before going to Calgary in 1942. A member of the Masonic Order and the I.O.O.F., he is survived by his widow, a daughter, his mother, two sisters and two brothers.

Dr. C. E. Fortin, died in Santa Monica, California, on August 9 following a lengthy illness. He graduated from the University of Manitoba and McGill University, doing postgraduate work in London, England. He served overseas with the R.C.M.C. during the First World War. At various times he practised in Newfoundland and Winnipeg. He is survived by his widow, a son, a daughter, a brother and a sister.

Dr. W. Leighton Gilbert, aged 68, medical practitioner in Toronto for many years, died August 24. He was born in Picton and was a graduate of the University of Toronto. He is survived by his widow.

Le Dr F.-X.-P. Goyette, autrefois de Sorel, est décédé le 29 juillet à sa résidence à Montréal. Il avait fait ses études au collège de l'Assomption et reçu son doctorat à l'Université de Montréal. Il avait pratiqué sa profession pendant 54 ans. Il était l'amie des pauvres et avait été pendant 25 ans président de la S. Vincent-de-Paul, paroisse S.-Edouard. Il laisse son épouse et trois sœurs.

Dr. A. W. Haldimand died on July 31, in Montreal, in his 86th year. Born in Montreal, he graduated from McGill in 1886. For many years he was medical director of the Thomas Davidson Co., now the General Steel Works, *The Montreal Daily Star*, and the Wire and Cable Co. He retired from active practice in 1937 after serving 20 years as medical director to the Northern Electric Co. He was formerly an active member of the Royal Montreal Curling Club. He is survived by his widow and two sons.

Dr. Ashton S. Langrill died on August 21 at Christie St. Hospital, Toronto. Born in Jarvis, he was a graduate of the University of Toronto in 1894. Dr. Langrill practised at Atkwood and in Hamilton just prior to the outbreak of the First Great War. He served in France with the Royal Canadian Army Medical Corps and was with the Haldimand Rifles, Canadian Militia, for 25 years with the rank of Lieut.-Col. He is survived by his brother and two sisters.

Dr. John Edgar McLean, aged 65, died at St. Joseph's Hospital in Sudbury on July 23. A native of Orillia, Ont., he was medical officer of health for the

town of Capreol, and one of the pioneer medical men of the Sudbury district. He is survived by his wife, a son, four daughters and a brother.

Dr. James Archibald MacLellan, aged 81, retired medical specialist, died at his home in Sydney, N.S., on July 28. Dr. MacLellan was a native of Ecoaomy, and after graduating from Queen's University and practising his profession for a period in Economy and Great Village took a course specializing in eye, ear, nose and throat surgery from the New York Infirmary. He came to Sydney in 1910 and set up a practice from which he retired in 1938. Surviving are three sons, a daughter and two brothers. Dr. MacLellan was a member of the Sydney Curling Club, the Royal Cape Breton Yacht Club and the Lingan Country Club and a veteran member of the Cape Breton Medical Society.

Dr. William Morrison, died at Southampton, Ont., on August 12. He was 88 years of age. Dr. Morrison was one of Sudbury's early pioneer general practitioners and he was formerly in charge of the Copper Cliff Hospital for Inc. He was a native of Kirkton Parish of Forghen Banffshire, Scotland. He attended parish school at Black Hills, Scotland and academy at Peterhead, before coming to Canada in 1869 with his parents. He attended public school and Hamilton Collegiate and later taught school for five years in Huron County. He graduated from the University of Toronto, School of Medicine in 1890 and practised in Durham, Pinkerton and Paisley. In 1906 he received his degree as member of the Royal College of Surgeons of England, and became a Licentiate of the Royal College of Physicians of London the same year. He returned to Canada the following year, and practised in Paisley before going to Copper Cliff in 1906. He remained in practice there till 1912 when he took over a private practice in Sudbury. Dr. Morrison was a member of the staff of St. Joseph's Hospital, Sudbury, from 1912 till 1941. In 1941 he retired, moving to Southampton. He was jail doctor in Sudbury for many years and also served in lumber and mining camps of that district. Surviving are his widow, two sons, a brother and a sister.

Dr. Robert L. Murray, a native of Cape Breton died at the home of his daughter, Mrs. Kenneth Spencer, Moneton, N.B., on July 15. Born at The Narrows, Cape Breton, in 1860, Dr. Murray practised medicine in Pictou and Springhill, later becoming assistant superintendent of the Nova Scotia Hospital, Dartmouth. He retired in 1927 and lived at the North Sydney family home, coming to Moneton three years ago. He is survived by his widow, one son and two daughters.

Le Dr J.-Aldéric Saint-Denis est décédé récemment à Montréal. Il était âgé de 77 ans. Né à Vaudreuil en 1871, il avait fait ses études au collège Bourget de Rigaud et à l'Université Laval de Montréal. Reçu médecin en 1894, il avait exercé sa profession d'abord dans son village, puis était venu s'établir à Montréal. Par la suite, il avait poursuivi ses études à Paris, s'était spécialisé dans le traitement des maladies des yeux, de la gorge et des oreilles. Il s'était retiré en 1943. Outre son épouse, il laisse deux filles, deux frères, et trois sœurs.

Dr. Moses Scherzer, prominent Montreal paediatrician and actively associated with the Jewish General Hospital and the Herbert Reddy Memorial Hospital, died suddenly on August 12, at Old Orchard Beach, Me., where he was holidaying with his family. He was in his 50th year. Honorary president of the Jewish Child Welfare Bureau, Dr. Scherzer was a director of the Baron de Hirsch Institute, president of the Montreal Clinical Society and a former member of the American Pediatrics Society. Active in Red Cross work during the late war, he was also on the staff of

the Mount Sinai Sanatorium at Ste. Agathe. He was a member of the Montefiore Club, St. George's Lodge No. 10, A.F. and A.M. and an alumnus of Pi Lambda Phi fraternity. A native of New York City, Dr. Scherzer moved to this city at an early age, attending Montreal High School and graduating from McGill University in 1918. In 1923 he did postgraduate work in Berlin and Leipzig.

Surviving are his widow, a son, a daughter, his mother, and a brother.

Dr. Alfred Brodie Stewart, who after fifty years of practice at Plumas, retired only last November, died on August 5 at Binscarth in the home of one of his three daughters. He graduated in medicine from Manitoba Medical College in 1895 and in 1933 was made a Life Member of the College of Physicians and Surgeons of Manitoba.

Dr. Frank A. Sullivan, aged 68, died suddenly of a heart attack on July 19, in Halifax. Born in St. Stephen he graduated from the Tufts Medical School, Boston, and was house physician for many years at the Palliser Hotel in Calgary, retiring in September, 1947, when he returned to the Maritimes and made his home in St. Stephen and Halifax. He is survived by three sisters, and three brothers.

Dr. H. F. Tyerman died on August 18 in the Royal Inland Hospital at Kamloops. He was born and raised on a farm 65 years ago at Seaforth, Ont. He graduated from the Toronto University in 1906 and immediately went to Kindersley, Sask., where he practised during the horse and buggy days and had many trying experiences during the cold winters fighting the blizzards. In 1928, he came to British Columbia on account of a chest condition he had developed and settled at Nakusp on the Kootenay Lake; while there he established a splendid reputation for practical work and good surgery. In 1942, he went to Ashcroft where he looked after a large area in the Cariboo. The work was heavy for him but he stuck to it. During the past year he was in bad health and had to bear with much suffering. He leaves his widow and his son, Don Tyerman of Vancouver.

NEWS ITEMS

Alberta

Dr. L. J. Patterson of Red Deer has recently been attending clinics at the University of Alberta hospital.

The epidemic of poliomyelitis appears to be subsiding throughout the province. Like other parts of Canada the disease was not concentrated in any centre but sporadic throughout with few deaths fortunately.

Dr. Gordon Bell has returned from London, England, where he was doing special cardiac investigation and cardiology. He has resumed his practice with his father Dr. Irving Bell of Edmonton.

Dr. F. H. Mewburn has been made honorary professor (clinical) of Orthopaedics at the University of Alberta upon his recent retirement from the faculty. Dr. Mewburn will continue his private practice in the city of Edmonton.

Upon the retirement of Dr. A. F. Anderson as Superintendent of the Royal Alexandra Hospital for twenty years, a banquet was given in his honour at which some 90 members of the profession attended to pay Dr.

Anderson honour. Dr. Donald Easton, formerly assistant superintendent now becomes the superintendent of the Royal Alexandra.

The new library of the University of Alberta is well under way and will be a great asset to the rapidly growing University; it is situated East of the medical building. The gymnasium has been moved one block South of its original position and will be close to the University rink. The new Aberhart Memorial hospital for tuberculosis is under construction in the Southern portion of the University grounds.

Dr. J. J. Ower has retired as Dean of the Faculty of Medicine at the University of Alberta. Dr. John Scott has been appointed to fill that position and will be assisted by Dr. H. E. Rawlinson of the Department of Anatomy. We are pleased to learn that Dr. Ower will continue with the University and will direct the pathological and clinical laboratories of the institution.

An error was made recently in stating that Dr. Singleton formerly of Calgary and now at the Coast had died. It so happens that he went to the B.C. coast and is well and hearty in his retirement. Our sincere apologies to Dr. Singleton. W. CARLETON WHITESIDE

British Columbia

The British Columbia Government has now sent out forms to every householder and self-supporting citizen in the Province, which must be filled out and returned, in order that the new Hospitalization Act may be put into force by January 1, 1949. At least six months' dues must be paid or arranged for in advance.

As a result of the new Hospitalization Plan, a great many organizations which provided hospital insurance have had to suspend this branch of their activities, as the coverage that they could provide would not be compatible with that provided by the new plan. Chief of these is the Blue Cross, which ceases its work in B.C. at the end of 1948.

The Government has taken cognizance of the almost certain prospect of a considerable increase in the demand for hospital beds in the near future. An item in the press reports a plan to go ahead with the extension of hospital accommodation, by an addition to the Vancouver General Hospital of some 825 beds. An expenditure of ten to eleven million dollars is contemplated. This extension will be available for the purposes of the medical school shortly to be inaugurated at the University of British Columbia.

It is to be hoped that due attention will be paid to the needs of other cities and towns in British Columbia where the urgency is quite as great, in proportion, as in Vancouver.

The annual meeting of the British Columbia Medical Association, to be held in Vancouver at the end of September, promises to be an extremely important meeting. The clinical part of the meeting includes a program of addresses, clinics, etc., which will be of a very high order. At, or about the same time, several other important meetings are being held. Thus, during the week preceding the actual meeting, the Paediatric Staff of the Victoria General Hospital is putting on a refresher course for general practitioners. The program includes paediatricians from all parts of the province and there will be clinics and demonstrations. An excellent program and will undoubtedly attract great many men. The British Columbia Society, the British Columbia Internists' Society and some other organizations are also holding their meetings at about this time.

A great deal of emphasis will be placed on matters at this annual meeting. This is on:

expected, in view of the developments along lines of socialized medicine in this Province and elsewhere in Canada. One or two announcements of great importance are expected, and the Committee on Economics of the British Columbia Medical Association, has done a tremendous amount of work in these matters.

It is expected that Mr. Pearson, the Provincial Minister of Health, will be present at the meeting, and will address us.

We regret greatly to report the recent death of Dr. George A. Kidd of Vancouver. Dr. Kidd was formerly Professor of Anatomy at Queen's University, and had practised in Vancouver for many years. He was the historian of the Vancouver Medical Association, and had been chronicling its doings for a long time—his writings appearing in the *Bulletin* from time to time.

Dr. W. Ronald Taylor, Vancouver, B.C., has been made a diplomate of the American Board of Otolaryngology at the recent examinations in Chicago.

Plans for an Academy of Medicine for Vancouver are going ahead and Dr. L. H. Appleby of that city is in charge of the campaign to head up these plans, and organize a plan of financing the building by whatever methods may be seen to be best. He is an admirable choice for the position.

J. H. MACDERMOT

Manitoba

Dr. Leon Rubin of Rivers has been appointed a coroner in and for the Province of Manitoba.

Professor John McKelvey, head of the Department of Obstetrics and Gynaecology, University of Minnesota, will be guest speaker at the annual meeting of the Manitoba Division of the Canadian Medical Association in Winnipeg, October 19, 20 and 21.

Dr. Steinn O. Thompson of Riverton, M.L.A. for Gimli, was honoured at a large gathering of his friends and patients at Ilana Park when he was presented with a new Ford car and a grandfather clock. Since the occasion of the gathering was the 25th anniversary of his marriage, and funds more than sufficient to cover the cost of the two gifts, it was decided to add a refrigerator. Characteristically, Dr. Thompson stated that he would accept the car but would set aside the cost as a trust fund for the erection of a hospital at Riverton. Born 55 years ago he served in World War I, graduated in medicine in 1921, and since then has practised on the west side of Lake Winnipeg. His son is a medical student; one daughter is engaged in social work in Winnipeg, and the other is a nurse in training in the Winnipeg General Hospital.

The by-law for the establishment of Minnedosa Hospital District No. 8 was passed with a 96% majority. The vote authorizes establishment of the hospital district and the erection of a \$130,000 modern hospital containing 30 beds, full operating and diagnostic facilities, office space for doctors and dentists and a maternity wing containing a nursery.

On August 8, the new Boissevain Memorial Hospital was dedicated as a tribute to the sacrifice of Boissevain's war dead. The new hospital will serve the municipalities of Boissevain, Morton and Minto and the village of Minto. Over 125 Canadian Legion members paraded to the hospital grounds to witness the unveiling of a bronze plaque and the dedication by Reeve A. A. Paterson of Morton. Subscriptions totalling over \$50,000 were collected for the hospital.

G. E. Delory, Ph.D. with his wife and family have come to reside in Winnipeg where Dr. Delory will be

Assistant Professor of Biochemistry in the Faculty of Medicine, University of Manitoba. He was formerly biochemist in the Department of Pathology.

ROSS MITCHELL

Nova Scotia

Dr. Lawrence Sutherland, son of Dr. R. H. Sutherland of Pietou, has accepted a temporary medical appointment in Newfoundland. Graduating this spring from Dalhousie University he is the fourth generation of Sutherlands to practice in Nova Scotia.

The forthcoming Annual Meeting of the Medical Society of Nova Scotia which will be shortly held at Celtic Lodge, Cape Breton Highlands National Park, will be fraught with important issues to the profession in Nova Scotia. A scheme of health insurance will be explored.

At a recent convention of the United Mine Workers of America, District 26, held at Truro, a resolution was passed endorsing co-operative medical schemes for mining areas. At present this is a live issue in the Cape Breton Coal Field, particularly in Glace Bay and New Waterford.

H. L. SCAMMELL

New Brunswick

Dr. P. C. LaPorte, of Edmundston, has received fresh recognition of his ability as a skilled wood carver. During the present summer he has exhibited some of his recent work at several American National Conventions, where it attracted much complimentary attention. One notable carving depicts in relief a group of the chief early workers in the production of penicillin.

Dr. Stephen D. Clark was elected to the N.B. Legislature to represent Saint John County at the recent provincial election. Re-elected at the same time were Hon. Dr. F. A. McGrath and Dr. E. R. Kennedy.

A small number of cases of typhoid has been reported in the neighbourhood of Moncton, traceable to untreated water supplies. The situation appears now under control. Only one case of polio has so far been reported in the Province this summer and it was of a mild type.

The general health of the population in New Brunswick must be good this year as more holidays are being enjoyed by more doctors than in any year since 1938. As is usual many of these holiday trips are being used as opportunities for study at clinical centres in Canada and the United States. In such cases a change is better than a rest due to the added knowledge that the holiday doctor brings back to his community.

Several doctors from Great Britain and Ireland are serving in New Brunswick Hospitals until they write the examinations of the Medical Council of Canada. These well qualified young physicians from the old country are a welcome addition to our Canadian profession.

The following physicians have recently registered with the Medical Council of New Brunswick and are practising at the addresses given: Dr. John Metcalfe, Calais, Me.; Dr. Phil d'Outremont, Moncton, N.B.; Dr. A. A. McVicar, Port Elgin, N.B.; Dr. Denis Stein, St. Quentin, N.B.; Dr. Norman J. Bellevue, Moncton, N.B.; Dr. Lloyd Allen, Hatfield Point, N.B.; Dr. L. H. Freeman, Saint John, N.B.; Dr. Earl R. M. Lee, Black's Harbour, N.B.; Dr. Marcus A. Deacon, Shediac, N.B.; Dr. Gordon L. Mitton, Richibucto, N.B.; Dr. Chas. W. Depow, Canterbury, N.B.; Dr. Peter G. Lyons, Moncton, N.B.; Dr. Melvin J. Acker, St. Stephen, N.B.

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Ontario

The University of Western Ontario is holding a graduate Lectureship in London, October 12 and 13. Dr. John McMichael, Professor of Medicine at the British Postgraduate Medical School, University of London, will speak on both days. His subjects will be "The Pharmacology of the Failing Human Heart" and "Pulmonary Heart Disease".

District Number Four of the Ontario Medical Association is holding its annual meeting in conjunction with the Clinical Day of the Hamilton Academy of Medicine in Hamilton on October 13. The business session will take place on the evening of the 12th. Twenty-seven local physicians will give clinics and lectures. In the evening a dinner will be held at the Collins Hotel, Dundas, when the organizational meeting of the Section on General Practice of the Ontario Medical Association will take place.

The annual business meeting of District Number Eleven of the Ontario Medical Association (Toronto District) will be held on the afternoon of October 27th at the Academy of Medicine Building. The scientific session will be held in conjunction with the Section on Surgery of the Academy at the Ontario College of Education Auditorium on the evening of November 2. The guest speaker will be Sir Archibald McIndoe, Chief of the Plastic Surgery Centre, Queen Victoria Hospital, East Grinstead, Sussex, England.

At the annual meeting of District Number Two of the Ontario Medical Association in Galt on November 3, Dr. Kenneth N. Campbell of Detroit will discuss "Various Aspects of Renal Failure" and "The Utilization of Lumbar Sympathectomy in Arteriosclerosis".

The annual meeting of District Number Nine of the Ontario Medical Association will be held in Timmins on October 3, 4, and 5. The guest speakers will be Dr. Melville C. Watson, Dr. Alan Brown, Dr. William Boyd of Toronto and Dr. G. S. Williamson of Ottawa. The Honourable Paul Martin will be the after dinner speaker.

The annual meeting of Districts Six and Eight will be held in Peterborough and Renfrew on October 19 and 20 and October 6 respectively.

Lady Banting has returned from England where she interned for two years in Manchester. She was successful in passing the examinations for membership in the Royal College of Obstetrics and Gynaecology.

Dr. Hans Friede has announced the opening of an office in Toronto for the practice of Neurology and Psychiatry. He graduated from the University of Berlin in 1930, then he studied in Leipzig, Königsberg and Magdeburg. He spent six months working with Dr. C. G. Yung in Zurich, Switzerland. After coming to Canada in 1939, he interned at the Ontario Hospital, Whitby. He now holds a specialist certificate in Neurology and Psychiatry.

Dr. Florene Haslam has arrived at Maple Leaf Hospital, Kangra, East Punjab, India after a year's furlough when she visited her parents in Toronto and did postgraduate work in surgery in Regina.

A membership of 1,100 in the University of Toronto Medical Alumni was reported at the annual meeting. Scholarships and bursaries to the amount of \$800 are being paid yearly. A new graduate bursary fund in Psychiatry has been announced.

The Association entertained the class of 1898 and the class of 1948 at a banquet at the Royal York in June. Twelve members of the class of '98 were present.

A postgraduate course is being put on by the Association at Sunnybrook Hospital on November 11, 12 and 13. The Varsity-Western Rugby game is to be on the afternoon of the 13th.

LILLIAN A. CHASE

Quebec

Au début de septembre, les médecins de langue française de l'Amérique du Nord se sont rendus en grand nombre à Ottawa et à Hull, où se tenait le dix-neuvième congrès de leur Association. Outre les réunions scientifiques, tenues au Château-Laurier, ce congrès était rehaussé d'une exposition d'art, de nombreuses projections cinématographiques, d'une réception à l'Ambassade de France, et se clôturait par un dîner et un bal au Château-Laurier.

Les professeurs Donald-A. Hingston et Urgel Gariépy, quittant les chaires de clinique chirurgicale à l'Université de Montréal, sont élus professeurs émérites. Le professeur J.-A. Jarry, qui occupait la chaire de phthisiologie, a été élu à la même dignité.

Le docteur Paul Bourgeois, chef du service d'uropathie à l'hôpital Notre-Dame, représentera la Canadian Urological Association, dont il est le trésorier, à l'Association internationale d'uropathie.

Le docteur Mercier Fauteux, de Montréal, a assisté aux Journées médicales de Bruxelles, où il représentait les universités montréalaises. Au cours de son voyage, il a visité les centres de chirurgie cardiaque de France et de Suède.

PAUL DE BELLEFEUILLE

Saskatchewan

Dr. G. Gordon has left Rosetown to reside in Chilliwack, B.C., due to ill health. His practice has been taken over by Dr. G. G. K. Graham and Dr. C. R. Giles.

The Moose Jaw and District Medical Society, through its staff meetings at the Moose Jaw General Hospital has been considering ways and means of increasing the hospital accommodation in the City of Moose Jaw. The shortage has been acute resulting in long delay for some patients. It was noted that the last addition to the Moose Jaw General Hospital was made in 1948.

After serious consideration and in order to get started, a citizens' meeting was called under the auspices of the Moose Jaw Medical Society. At this meeting a committee was established to open a campaign to collect funds to assure the community that adequate hospital facilities would be built.

The initiative of the physicians of Moose Jaw in calling this citizens' meeting and starting action on their new hospital, is to be commended.

The Council of the College met recently in North Battleford guests of the Sisters of Notre Dame Hospital and the member for that District, Dr. J. J. Hamelin. The doctors were very impressed with the very modern and beautifully appointed addition to the hospital. It has been constructed with the view of being a real health centre for the district.

The Council of the College at its recent meeting, taking note of the retirement of Dr. R. G. Ferguson, and the very fine contribution he has made to the profession, conferred upon him an Honorary Membership in the College. Dr. Ferguson, through his leadership in the attack on tuberculosis has succeeded in establishing the Province of Saskatchewan as a model to other countries.

G. GORDON FERGUSON

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General

American Board of Ophthalmology. Candidates for the certificate of the American Board of Ophthalmology are accepted for examination on the evidence of a written qualifying test. These tests are held annually in various parts of the United States. Registration is already closed for the next test to be given in January, 1949. Applications are now being accepted for the 1950 written test. They will be considered in order of receipt until the quota is filled.

Practical examinations for acceptable candidates, 1949: San Francisco, March 21 to 24; New York, June 11 to 15; St. Louis, October 15 to 19; Boston, December. Apply Dr. S. Judd Beach, Executive Office, Cape Cottage, Maine.

The Twelfth British Congress of Obstetrics and Gynaecology. This meeting will be held in London, England, July 6 to 8, 1949.

Owing to the difficulties that exist at the present time in arranging hotel accommodation, travel, etc., the Hon. Secretaries would like to have the names of those who hope to attend by March 31, 1949 at the latest, and, if possible, very much before that date. Ian Jackson, Hon. Sec'y., 58 Queen Anne St., London, W. 1.

The American Goitre Association will meet in the Hotel Loraine, Madison, Wisconsin, May 26, 27, and 28, 1949. The program for the three day meeting will consist of papers dealing with goitre and other diseases of the thyroid gland, dry clinics and demonstrations.

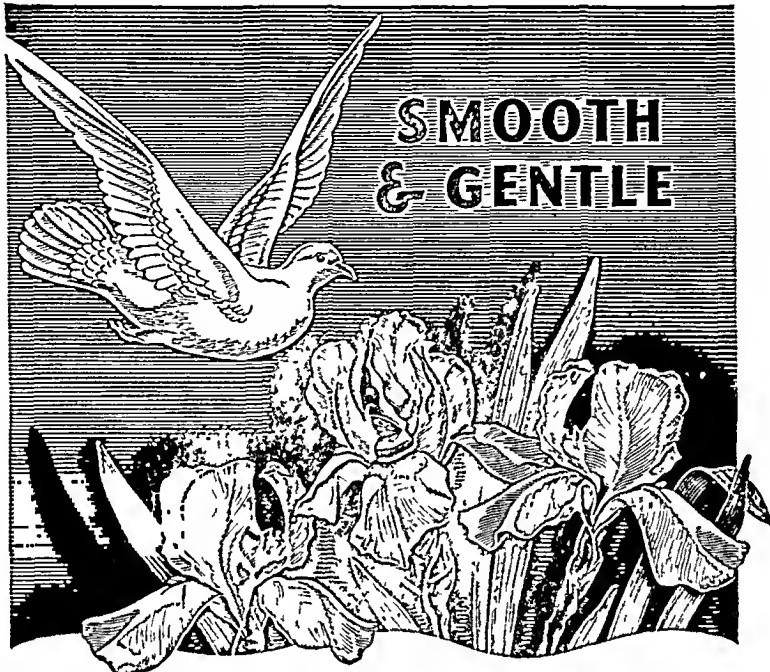
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<i>Home town</i>	<i>Name of Fellow</i>	<i>Graduated from</i>	<i>To work at</i>	<i>In</i>
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Montreal	Kobernick, Dr. S. D.	McGill	McGill	Pathology
	Nunes, Dr. Doris S.	McGill	McGill	Bacteriology
	Payne, Dr. T. P. B.	McGill	McGill	Pathology
	Phaneuf, Dr. Jean	Ste. Marie College	Montreal	Medicine and Surgery
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	Mackenzie, Dr. K. R.	McGill	Royal Victoria Hospital	Medicine
Ontario				
Belleville	Younghusband, Dr. O. Z.	Queen's	Queen's	Pathology
Brownsville	Cook, Dr. W. H.	Western Ont.	Western Ont.	Anatomy
Chatham	Stewart, Dr. H. B.	Toronto	Toronto	Biochemistry
London	Buck, Dr. R. C.	West m. Ont.	Western Ont.	Biochemistry
	Hatcher, Dr. J. D.	Western Ont.	Western Ont.	Physiology
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Parry Sound	Loynes, Dr. J. S.	Queen's	Western Ont.	Pharmacology
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St. Catharines	Teasdall, Dr. R. B.	Western Ont.	Western Ont.	Physiology
Toronto	Little, Dr. J. A.	Toronto	Toronto	Biochemistry
	Bresnahan, Dr. T. J.	Queen's	Queen's	Medicine
	Taylor, Dr. N. B. G.	Toronto	Western Ont.	Medicine
	Fraser, Dr. D.	Toronto	Toronto	Medicine
	Fitzgerald, Dr. J. P.	Cambridge	Queen's	Pathology
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	Slade, Dr. H. C.	Dalhousie	Toronto	Medicine
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A report entitled Medical and Hospital Services Provided under Prepayment Arrangements, Trinity Hospital, Little Rock, Ark., 1941-42 has been prepared by Margaret C. Klem, Helen Hollingsworth and Zelma A. Miser. It covers a study of physicians' care in the office, home and hospital and hospitalization received by subscribers and their dependents under prepayment arrangements, and extends over a period of two years.

The report is for sale at the Government Printing Office, Washington, D.C., price \$1.00. A preliminary report by Margaret Klem for the first year on the same subject is also available at 5¢ a copy.

National Research Council Appoints Subcommittee on Oncology. The Committee on Pathology of the National Research Council has appointed a Subcommittee on Oncology. The members are: Dr. Shields Warren, Chairman; Dr. Baldwin Lucké; Dr. Fred Stewart; Dr. Harold Stewart; Dr. Arthur P. Stout; Dr. Milton C. Winteritz; Dr. Howard T. Karsner, Chairman of Committee on Pathology, *ex-officio*.

The objectives of the Subcommittee are: (1) Improvement in the teaching of oncology; (2) Dissemination of information on oncology to clinical pathologists, students and teachers of oncology; (3) The establishment of criteria for diagnosis of tumours; (4) The simplification of terminology by recommending a single term for each tumour and listing separately the appropriate synonyms.

The Subcommittee expects to work with existing agencies to promote clarity and unity in tumour nomenclature and classification.

Urology Award. The American Urological Association offers an annual award of \$1,000.00 (first prize of \$500.00, second prize \$300.00 and third prize \$200.00) for essays on the result of some clinical or laboratory research in Urology. Competition shall be limited to urologists who have been in such specific practice for not more than five years and to residents in urology in recognized hospitals. For full particulars write the Secretary, Dr. Thomas D. Moore, 899 Madison Avenue, Memphis 3, Tennessee. Essays must be in his hands before February 15, 1949.

BOOK REVIEWS

Rorschach Study of the Psychological Characteristics of Alcoholics. C. Buhler, Consulting Psychologist, Los Angeles County General Hospital, and D. W. Lefever, Professor of Education, University of Southern California, 64 pp. \$0.75. Hillhouse Press, New Haven, Connecticut, 1948.

This small monograph is the sixth of a series of studies on alcohol from the Yale Laboratory of Applied Physiology and has been reprinted from the *Quarterly Journal of Studies on Alcohol*. It is also part of a larger study intended to establish more effective criteria for Rorschach interpretation. To the average medical reader the more technical portion of this report, dealing with Rorschach signs and their graphic analysis, will hold little interest and will prove difficult to follow. The study is controlled with non-alcoholic groups, and the alcoholics are subdivided into several diagnostic categories. The conclusions of the authors are interesting and deserve further study. In the alcoholic individual, it is felt, anxiety results from loss of control in acute tension-producing situations. He is unable to stand this acute anxiety and immediately escapes into alcohol. This alcoholic refuge from acute tension is not comparable to the symptoms of a psychoneurosis; these latter are reactions to deep-level conflicts of long standing. Both mechanisms may be at work in the same individual, however. Further, the alcoholic differs from the psychopath in that he escapes

with a bad conscience. This small booklet presents well the thesis of the authors. It should be of interest to the average medical reader as well as to the specialist.

Bilharzial Cancer. M. A. Afifi, Former Director of the Radiological and Electrotherapeutic Departments of the Egyptian Government Hospital, Alexandria, 111 pp., illust. 16s. H. K. Lewis & Co. Ltd., London, 1948.

This little book makes interesting reading. Dr. Afifi's long experience with the diagnosis of cancer associated with bilharzial infection strongly suggests a cause and effect relationship between the two diseases. The bladder and lower bowel are the sites in which the association is generally found. When the two diseases coexist treatment becomes a problem. Surgical interference involves the risk of sepsis greater than usual because of the condition of the tissues due to bilharzial infection. Radiological methods therefore offer the best hope of cure provided they can be applied. A foreword by Sir Alfred Webb-Johnson strongly recommends the book. This recommendation seems justified and the work should be of help to radiologists and surgeons working in regions where bilharziasis is a common disease.

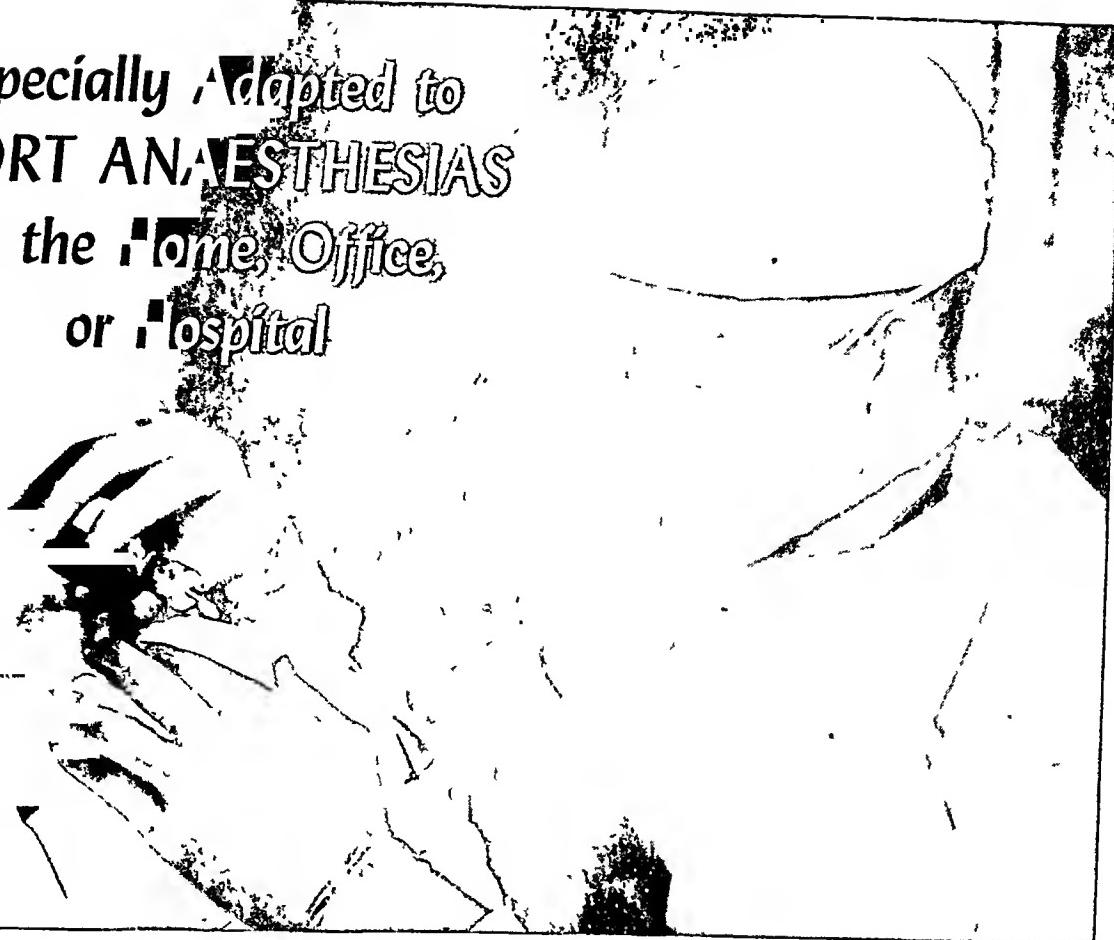
Anatomy of the Bronchial Tree. R. C. Brock, Surgeon to Guy's Hospital. 98 pp., illust. \$12.00. Oxford University Press, London, New York, Toronto; McAinch & Co. Ltd., Toronto, 1947.

This monograph, a reprint of previous publications by the same author, with some additions, deals with the anatomy of the bronchi and the pulmonary segments. The practical application of this knowledge to the radiological localization and surgical approach of lung abscesses is also discussed. It is based on the dissections of normal and diseased lungs, metallic casts of the bronchi, bronchograms and post-mortem specimens. The book is written simply and lucidly and is profusely illustrated with photographic reproductions of the authors' dissections and casts, diagrams and bronchograms, as well as ordinary radiographs of the lungs. These make it easy to follow the text. There is also a short chapter on the level of the lung fissures and one on supernumerary and anomalous bronchi. This is the first book to appear on bronchopulmonary segmentation and its clinical application in the investigation of localized pulmonary disease. As such it should be of interest to every thoracic surgeon, physician, radiologist and bronchoscopist.

Practical Clinical Psychiatry. E. A. Strecker, Professor of Psychiatry, School of Medicine, University of Pennsylvania; F. G. Ebaugh, Professor of Psychiatry, University of Colorado, School of Medicine; and J. R. Ewalt, Professor of Neuro-Psychiatry; Director, Galveston State Psychopathic Hospital, University of Texas Medical Branch. 476 pp., illust., 6th ed. \$5.00. The Blakiston Co., Philadelphia and Toronto; Doubleday Publishers, Toronto, 1947.

This sixth edition of what has become the recognized American textbook for students of psychiatry in United States, has retained all its former virtues of clarity and easy reading with adequate scope to cover the subject. The book has been brought up to date with the general and steady advances made in psychiatry since the fifth edition in 1940. In the introduction and where indicated, references are made to the psychiatric problems highlighted by either the acute or extensive problems of the past war. In future editions it is hoped that the authors will have more to offer in the prevention and treatment of those mental disorders associated with old age. The book is recommended as a satisfactory standard text that fills a definite need and the authors are to be congratulated on maintaining its character throughout the years.

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LITERATURE ON REQUEST



Clinical Diagnosis by Laboratory Methods. J. C. Todd, Late Professor of Clinical Pathology, University of Colorado School of Medicine; A. H. Sanford, Professor of Clinical Pathology, Mayo Foundation, University of Minnesota, with the Collaboration of G. G. Stilwell, Division of Clinical Laboratories, the Mayo Clinic. 954 pp., illust., 11th ed. \$8.25. W. B. Saunders Co., Philadelphia and London; McAinch & Co., Ltd., Toronto, 1948.

This standard manual of clinical pathology has been considerably revised and extended. In particular, a full chapter is now devoted to medical mycology, while considerable additional material has been included in the chapters on serodiagnostic methods and on haematology. This manual provides reasonably complete coverage of the practical aspects of routine clinical laboratory procedures. It should be borne in mind, however, if this book is being used as a guide for the installation of a laboratory procedure, that in some cases, newer, simpler techniques are available, which offer advantages over the older routine methods.

Common Contagious Diseases. P. M. Stimson, Associate Professor of Clinical Paediatrics, Cornell University Medical College. 503 pp., illust., 4th ed. \$4.00. Lea & Febiger, Philadelphia; Macmillan Co. of Canada, Toronto, 1947.

This book will be a very useful addition to the general practitioner's library and should be a helpful volume for any student. It is well-written and easy to read. The first three chapters take up the principles of contagion, serum reactions and the use of sulphonamides in the common contagious diseases. The main contagious diseases, common to this country, have been fully discussed. The treatment and prophylactic measures have been well outlined.

Fundamentals of Human Reproduction. E. L. Potter, Associate Professor of Pathology, Department of Obstetrics and Gynaecology, School of Medicine, University of Chicago. 231 pp., illust. \$3.50. McGraw-Hill Book Co., Inc., New York, Toronto and London, 1948.

In her treatment of this subject, Dr. Potter has broken away from the usual textbook style and she presents the miracle of birth in a dramatic fashion which is also very readable. The first section of the volume includes a study of early forms of animal life, the general pattern of reproduction and the factors responsible for body form. Succeeding chapters deal with all phases of human reproduction, from the anatomy of the sex organs through a discussion of the processes concerned with the development of each organ of the human body. Scientific terminology has been simplified to a remarkable degree thus enhancing the value of the book as background reading. Dr. Potter has taught nurses for many years and her book has been written with a view to assisting student nurses in the study of obstetrics. It will, however, be welcomed by interns as well as by those general readers who are interested in human origins.

Hospital Care of Neurosurgical Patients. W. B. Hamby, Professor of Neurology and Neurological Surgery, University of Buffalo School of Medicine, Buffalo. 156 pp., 2nd ed. \$4.00. Charles C. Thomas, Springfield, Illinois; The Ryerson Press, Toronto.

Specific directions for the management of neurosurgical patients are given most of the consideration in this manual. Interns and nurses, however, will find much in the book which may be of help in caring for all types of patients. The section headed, "General Considerations", might well form the basis for the instructions to be given housemen at the start of their internship. The author briefly reviews the anatomy which pertains to the

central nervous system; follows this by concise instructions in diagnostic procedures; then in tabular and summary form outlines methods for the care of specific neurosurgical disorders. Emphasis is placed on the possible development of complications and the recognition of complications once they have occurred. It is stated that housemen should themselves be able to estimate the quantities of albumen and globulin in samples of cerebrospinal fluid, but one wonders if these complicated laboratory procedures can be carried out by untrained interns. Contrary to the present day teachings in many centres, large amounts of heat are still recommended for shocked patients. Hospital libraries would do well to add this book to their shelves for the guidance of interns.

Human Physiology. F. R. Winton, Professor of Pharmacology, University College, London; and L. E. Bayliss, Reader in Physiology, University College, London. 592 pp., illust., 3rd ed. \$8.00. The Blakiston Co., Philadelphia and Toronto, 1948.

The third edition of this text is an improvement over previous versions. Because of the format it is actually shorter than would appear at first sight. Designed for first year medical students it is an adequate short text but will not satisfy the inquiring mind.

Identification of Tumours. N. C. Foot, Professor of Surgical Pathology, Cornell University Medical College. 397 pp., 241 illust. \$7.50. J. B. Lippincott Co., New York, Montreal, 1948.

This should prove to be a very useful volume for the busy surgical pathologist. The material is very concisely and conveniently arranged under the various systems and organs. There are numerous illustrations which are of good quality and are well placed in reference to the text. The whole field of pathology of tumours is covered in 390 pages, including a chapter on technical methods of fixing and staining, and a ready reference table for the tentative identification of neoplasms.

Operative Gynaecology. H. S. Crossen, Professor Emeritus of Clinical Gynaecology, Washington University School of Medicine; and R. J. Crossen, Assistant Professor of Clinical Gynaecology and Obstetrics, Washington University School of Medicine. 999 pp., illust., 6th ed. \$16.50. C. V. Mosby Co., St. Louis, Mo.; McAinch & Co. Ltd., Toronto, 1948.

The sixth edition of this well known work which was first published in 1915 appears ten years after the fifth edition. As in that time there have been advances and discoveries, this edition is entirely revised and reset. The aim of the senior author from the first has been to be a guide to the operator, not merely in describing the successive steps of an operation, but in selecting the particular operation best suited to the patient. In this edition the authors, father and son, have two further aims, the extension of practical means for the prevention of cancer of the ovaries, uterus and external genitals, and the development of measures for giving more effective local relief to patients with general handicaps which contraindicate operative removal of the seriously troublesome pelvic lesion. To this end mention is made of the application of radium and deep x-ray therapy and of the administration of sex hormones. The medico-legal aspects of operative gynaecology and the insistence on the necessity of the utmost care to prevent a foreign body being left in the abdominal cavity are worthy of note.

A few omissions are noted; e.g., the Pomeroy method of sterilization is not mentioned, disgerminoma is not included among the ovarian tumours, there is no reference to the peritoneoscope, the culdescope or pneumoperitoneum in diagnosis of obscure pelvic conditions. All in all the book can be trusted to give carefully reasoned, clearly phrased selective guidance.

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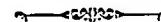
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The course will be so arranged that the operative procedures and bedside conferences of the one specialty will be held in the mornings and the didactic conferences or lectures in the afternoons. The reverse of this procedure in the other specialty will make it possible to pick whatever subjects may be of interest to each applicant.

Guest speakers will give lectures and clinics in both subjects of the course. The fee will be \$60.00. The course will be given for a minimum of 10 students and a maximum of 20 students. Application should be made to the Medical Office, University of Toronto, and the closing date will be November 30th, 1948.

NEW YORK POST-GRADUATE MEDICAL SCHOOL

Courses for General Practitioners

ALLERGY

Three Weeks — November 4 to 24, 1948

Morning sessions devoted to laboratory instruction in the preparation and standardization of protein extracts, while afternoon sessions in the large out-patient clinic deal with the diagnosis and treatment of asthma, hay fever, and other allergic diseases, the technique of skin tests and hyposensitization, and the role of focal infections in allergy. Fee, \$200.

CARDIOLOGY

Five Days — November 8 to 12, 1948

This course is designed to cover the field of clinical cardiology. Emphasis is placed on the auscultatory findings in cases of heart disease, and current methods of diagnosis and therapy are stressed. Fee, \$55.

GASTROENTEROLOGY

Ten Days — November 29 to December 10, 1948

Diseases of the esophagus, stomach, intestines and rectum studied with special reference to diagnosis and treatment. Consideration is given also to disorders of the glands associated with the alimentary canal. The importance of X-ray findings, and of chemical and bacteriological studies in diagnosis is indicated. Gastroscopy, sigmoidoscopy, and duodenal drainage are demonstrated and their significance discussed. Newer methods of treatment are presented with special reference to pathological physiology of the gastrointestinal tract. Fee, \$100.

REVIEW OF CLINICAL PEDIATRICS

Six Days — November 29 to December 4, 1948

Review of the most practical problems encountered in pediatric practice. Clinical lectures, conferences, ward rounds and case demonstrations are given by specialists in the various phases of pediatrics. Special emphasis is placed upon infant feeding, preventive pediatrics, chemotherapy, cardiology, and care of the premature infant. Fee, \$60.

*For information about these and other courses,
and for application, address*

The Dean, 311 East 20th Street, New York 3, N.Y.

PUBLIC HEALTH AND RELATED FIELDS

Federal grants now being made to Provincial Departments of Health permit of extending health services. Financial assistance in postgraduate study is being given by Provincial Departments of Health to certain candidates.

Diploma in Public Health

In addition to the regular courses of instruction, provision has been made for suitably qualified candidates to receive the basic training in public health and also to prepare for appointments in special fields including:

PUBLIC HEALTH NUTRITION • PUBLIC HEALTH EDUCATION

ADMINISTRATION OF MEDICAL CARE

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A postgraduate course in hospital administration for graduates in medicine and also for other university graduates who have acceptable academic standing, experience and aptitude, providing one session of nine months and twelve months of supervised hospital experience as an intern in hospital administration.

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PROCTOLOGY AND GASTRO-ENTEROLOGY

A combined course comprising attendance at clinics and lectures; instruction in examination, diagnosis and treatment; witnessing operations; ward rounds; demonstration of cases; pathology; radiology; anatomy; operative proctology on the cadaver.

FOR THE GENERAL SURGEON

A combined surgical course comprising general surgery, traumatic surgery, abdominal surgery, gastro-enterology, proctology, gynecological surgery, urological surgery. Attendance at lectures, witnessing operations, examination of patients pre-operatively and post-operatively and follow-up in the wards post-operatively. Pathology, roentgenology, physical therapy. Cadaver demonstrations in surgical anatomy, thoracic surgery, regional anesthesia. Operative surgery and operative gynecology on the cadaver.

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Intensive full time instruction covering those subjects which are of particular interest to the physician in general practice. Fundamentals of the various medical and surgical specialties designed as a practical review of established procedures and recent advances in medicine and surgery. Subjects related to general medicine are covered and the surgical departments participate in giving fundamental instruction in their specialties. Pathology and radiology are included. The class is expected to attend departmental and general conferences.

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Demonstration of regional anatomy on the cadaver, and of operations on the ear, sinuses and larynx. Didactic and clinical lectures and discussions by specialists in various related fields that are important to the otolaryngologist in diagnosis and treatment. Fee, \$150.

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Five Days—December 6 to 10, 1948

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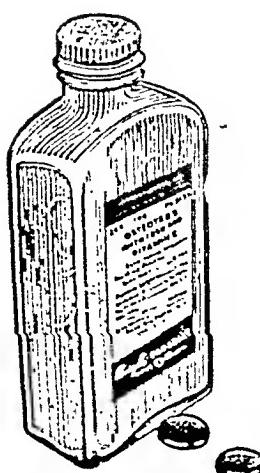
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Amino acid and polypeptide nitrogen	3.6%
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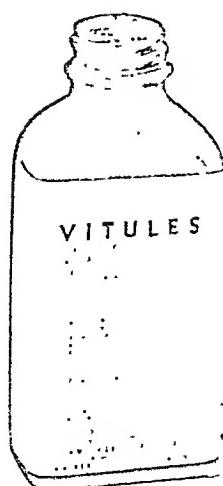


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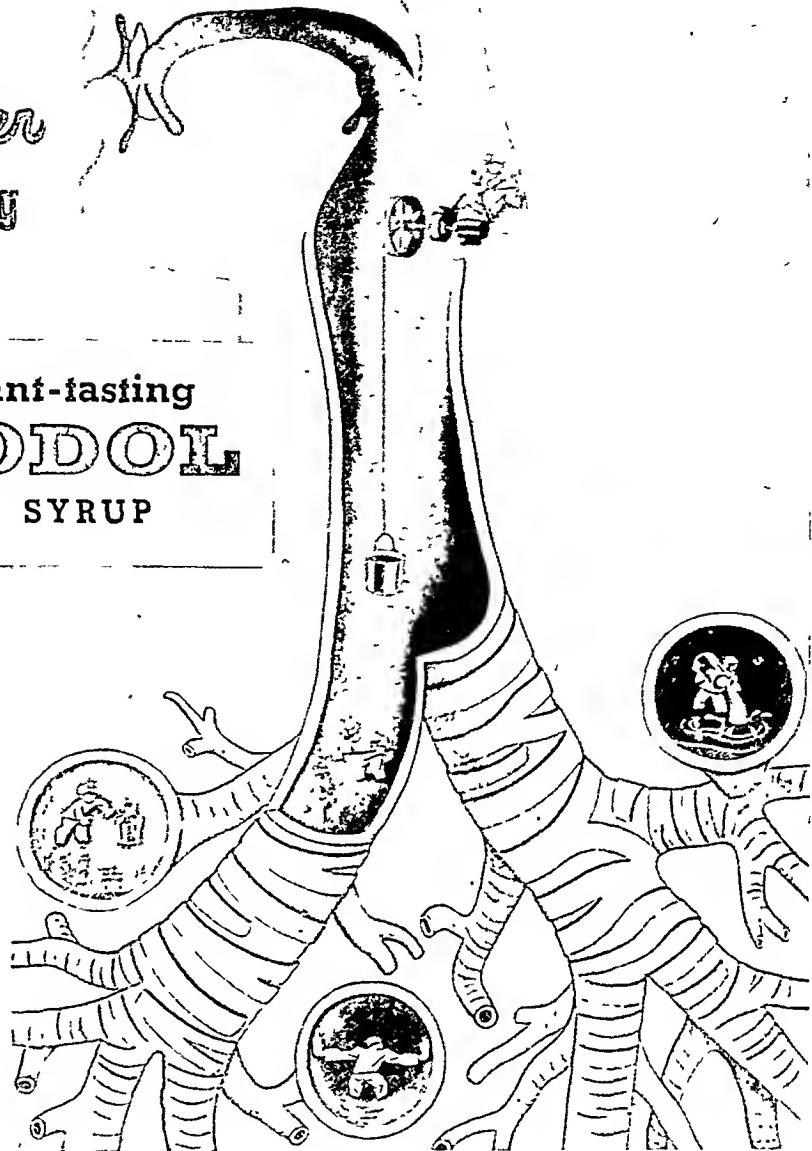
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As his depression diminishes, the
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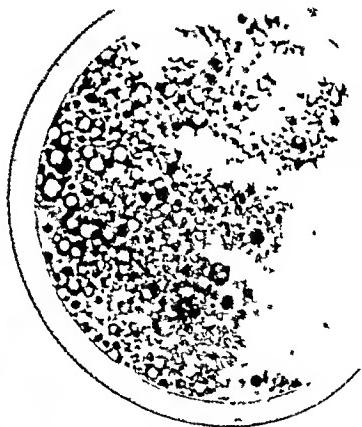
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This permits normal heat radiation and perspiration to escape readily, thus lessening the danger of irritation.



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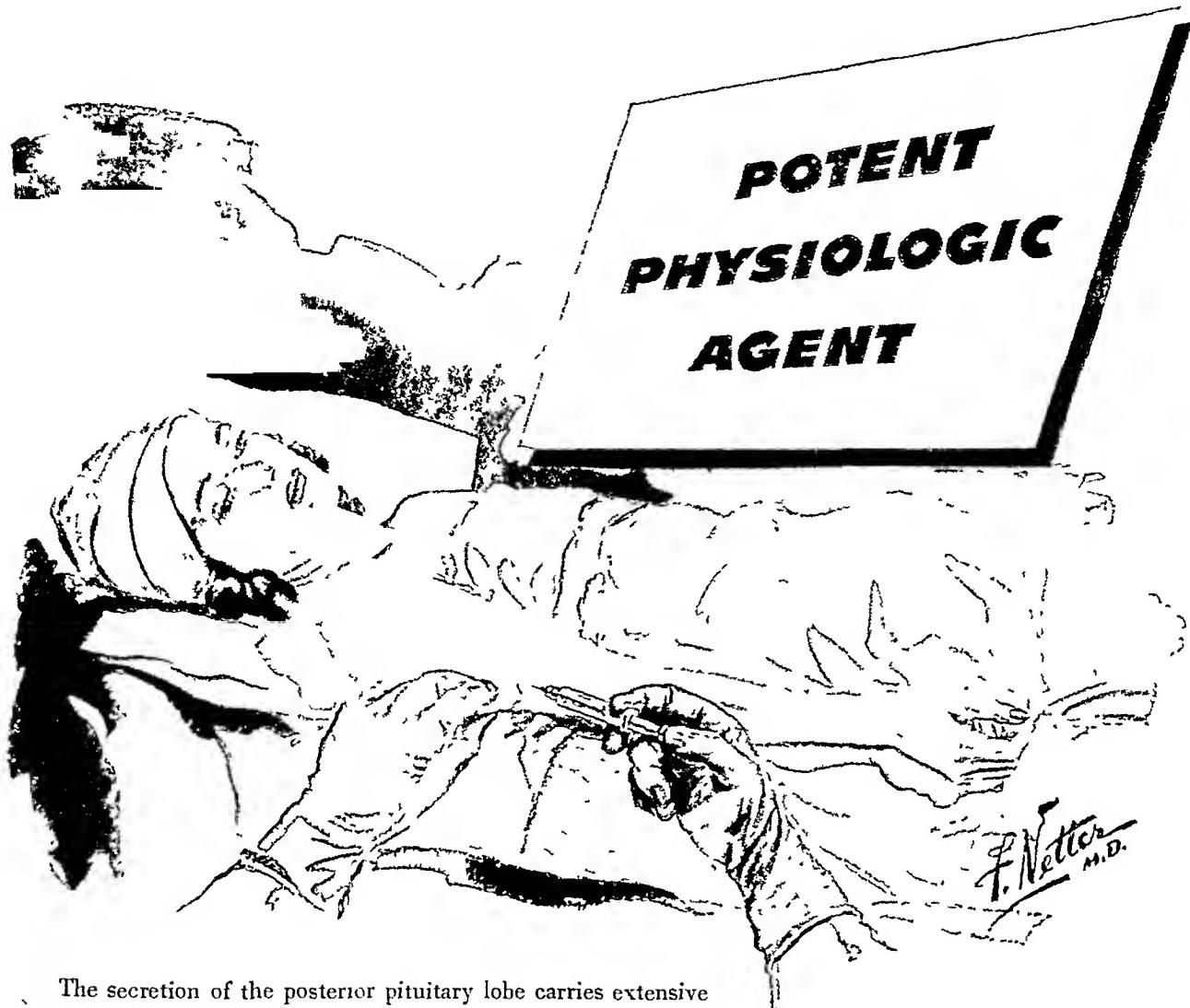
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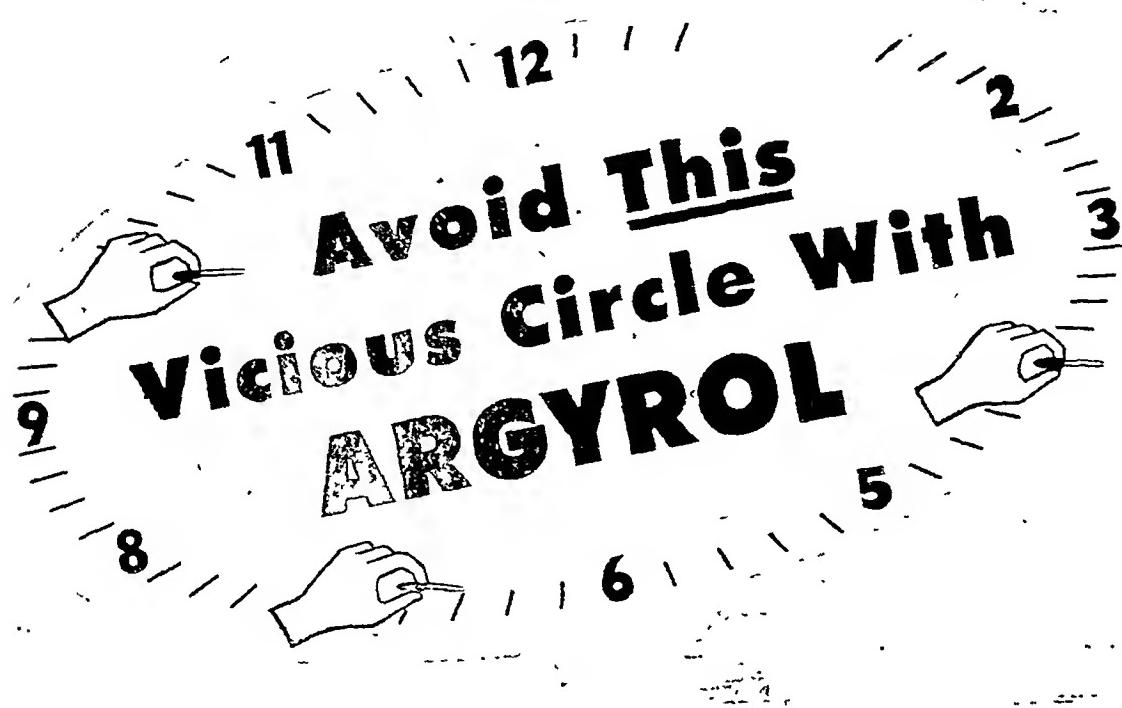
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It becomes increasingly evident that the compensatory congestion following use of many vasoconstrictors is creating the seeming necessity for repeated use—thus creating the vicious circle which leads to Rhinitis Medicamentosa.

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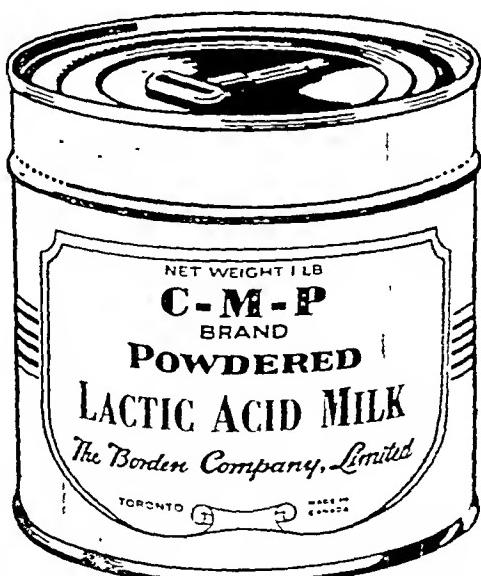
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Advantages of Specially-Processed Senna

Senna, as used in Castoria, is treated by a special, modern, extraction process, developed by the makers of the product.

This unique process extracts the laxative principle of the senna leaves, imparting to Castoria its gentle, non-griping yet effective laxative action.

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FOR DETECTION OF SUGAR IN THE URINE

Acetone Test (Denco)

FOR DETECTION OF ACETONE IN THE URINE

THE SAME SIMPLE TECHNIQUE FOR BOTH

I. A LITTLE POWDER



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COLOR REACTION IMMEDIATELY



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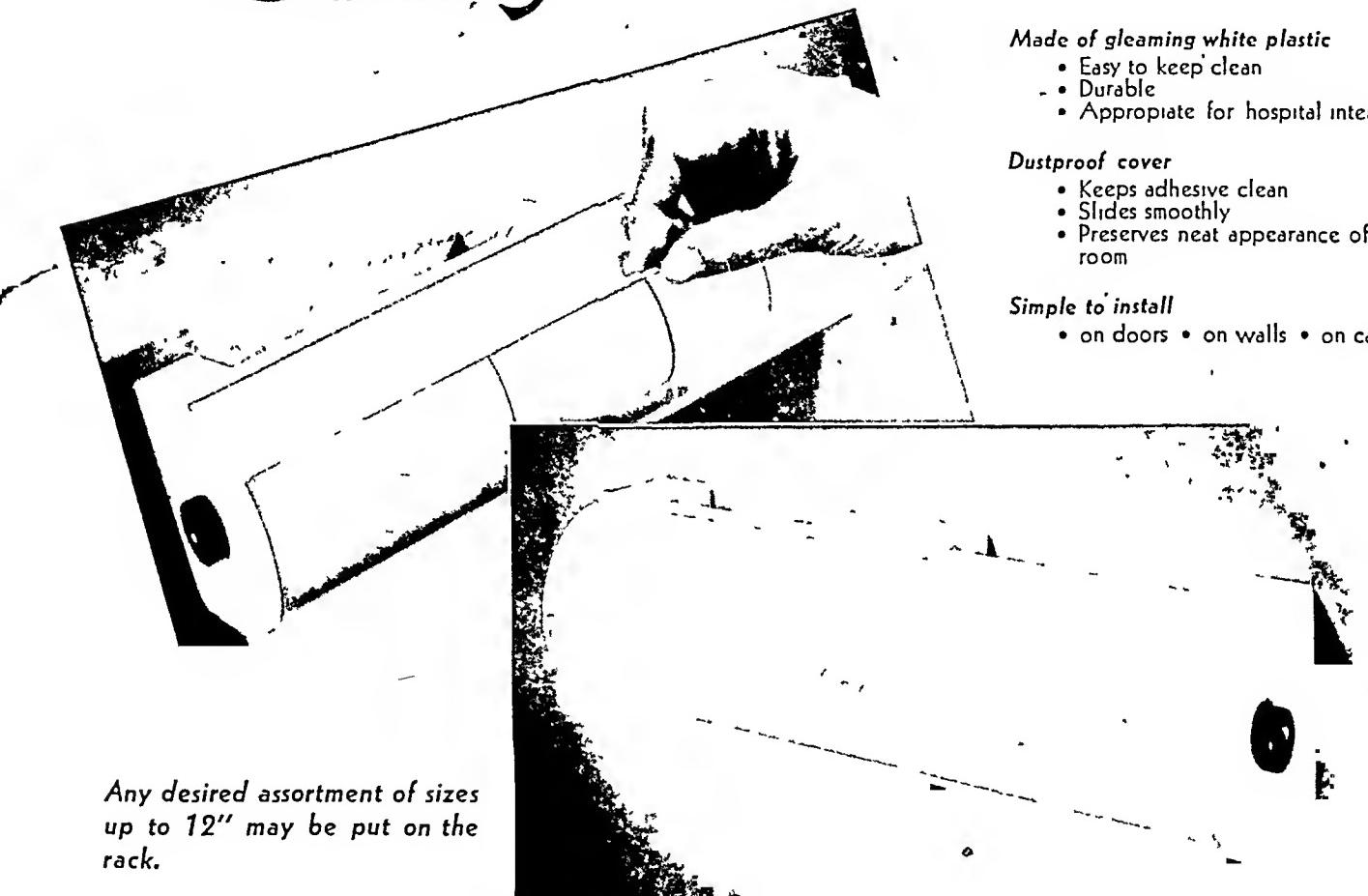
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- Slides smoothly
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● Curity Adhesive combines the qualities of flexibility and high tensile strength. Sticks quickly, adheres firmly with minimum creep. Made in many forms for every adhesive need. A distinctive quality is the minimal irritation of the most sensitive skin. Through controlled manufacture of the ingredients in the mass the quality is uniformly maintained. Curity adhesive has long life

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More than "Replacement" IN HYPOCHROMIC ANEMIA

In hypochromic anemia the need not only for iron but for the vitamins as well is so great that the required amounts of these substances cannot be obtained from food alone.

Heptuna offers a convenient means of supplying highly available iron and adequate dosages of essential vitamins, all of which are necessary in the speedy correction of secondary anemia.

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"Ferrous sulphate . . . in recent assay studies has been found to be one of the . . . most effective forms of iron medication."

I. Barr, D. P.: *Modern Medical Therapy in General Practice*, Baltimore, Md., the Williams & Wilkins Company, 1940, vol. 3, pp. 2929-2930.

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The anorexia, hypochlorhydria and disturbed digestion frequently associated with hypochromic anemia, tend to initiate or augment multiple nutritional deficiencies. The fat-soluble vitamins as well as the B-complex factors must be supplied.

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The B-complex vitamins contained in Heptuna tend to improve the appetite, increase the efficiency of the digestive tract, and thus make Heptuna more readily tolerated even by many patients who cannot take iron alone.

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Ferrous Sulfate.....	4.5 Grains
Vitamin A (Fish-Liver Oil).....	5,000 Int. Units
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Vitamin B ₁ (Thiamine Hydrochloride).....	2 mg.
Vitamin B ₂ (Riboflavin).....	2 mg.
Niacinamide.....	10 mg.

Together with other B-complex factors from liver and yeast.



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a ROERIC preparation

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**New Zenith "75" is the ONLY
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THE advantages of having your patient test a hearing aid under actual hearing conditions are obvious. Yet—until Zenith introduced the new Zenith "75"—your patient could not make such a test without risking the loss of his down payment if the hearing aid proved unsatisfactory.

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"YOUR PHYSICIAN IS THE ONLY PERSON QUALIFIED TO EXAMINE YOUR EARS AND PRESCRIBE A HEARING AID"

This statement appears currently in Zenith Hearing Aid advertisements. In presenting the new Zenith "75" to the public, we urge all those with impaired hearing to rely only upon the medical profession for diagnosis, therapeutic recommendations, and counsel

as to whether a hearing aid can be helpful.

When a hearing aid is indicated, it is important that it be worn for a trial period in normal sound conditions. That is why the Zenith Hearing Aid is offered on a ten-day trial basis, with a guarantee of full refund if it does not prove acceptable.

As you know, the Zenith Hearing Aid is a precise scientific instrument, adjustable to the wearer's needs in somewhat the same way that binoculars are adjustable to various conditions of seeing. Frequency and volume controls enable the patient himself—better than any salesman-consultant—to determine the exact adjustments needed.

Zenith gives full and practical recognition to this basic fact in making available the new Zenith "75" Hearing Aid on a money-back trial basis on direct sales by Zenith Radio Corporation and subsidiaries. We shall continue in every advertisement to tell our readers to consult only their doctor for advice on their ears and hearing.

*This offer available on direct sales by Zenith Radio Corporation or its subsidiaries.

Look only to your doctor for
advice on your ears and hearing



NEW ZENITH
RADIONIC HEARING AID
BY THE MAKERS OF THE WORLD-FAMOUS ZENITH RADIOS

DOCTOR: This coupon is for your use—or you can give it to your patient to use:

Zenith Radio Corporation of Canada, Ltd.
Canada Trust Bldg.
Dept. CMA108, Windsor, Ont.

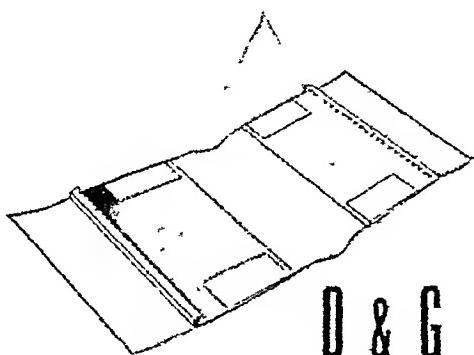
Enclosed please find money order or check (send no cash) for \$75, for one Zenith "75" Hearing Aid. Unless I am completely satisfied and find the Zenith "75" superior to any other hearing aid, I may return it within 10 days of receipt and get my money back in full.

Please send details of your convenient time payment plans, and free descriptive literature.

Name

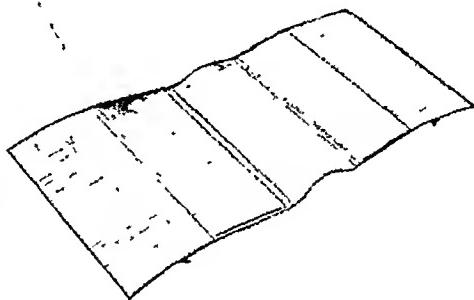
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City Province



Announcing

D & G TRACTACLIP



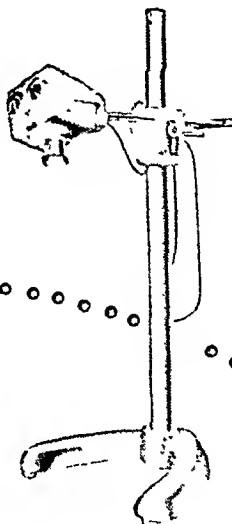
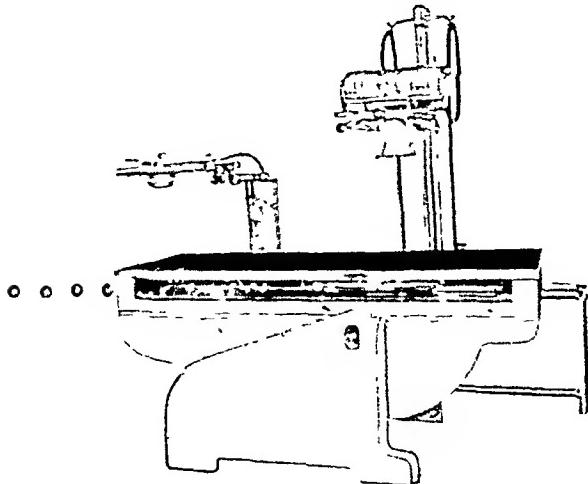
Traction is supplied by a sheet of latex connecting two metal members which grip the skin by means of fine-toothed edges, providing firm anchorage with minimal discomfort. TRACTACLIP can be readily removed for wound inspection.

- a wound approximator that exerts a gentle, continuous traction on the edges of gaping wounds. It enables the surgeon to effect, through this traction, the desired approximation of tissues. Some of the various uses of TRACTACLIP* Wound Approximator are...
- as an emergency dressing to reduce bleeding and secondary contamination.
- to narrow the gap gradually and help replace lost skin by elongating the skin on either side of the wound.
- to prevent retraction of skin's edges while a contaminated wound is being prepared for secondary closure.
- to relieve traction on skin sutures when the wound has been closed under tension.
- to reduce the area of raw surface and protect it from contact with overlying gauze.



DAVIS & GECK, INC.
BROOKLYN 1, NEW YORK

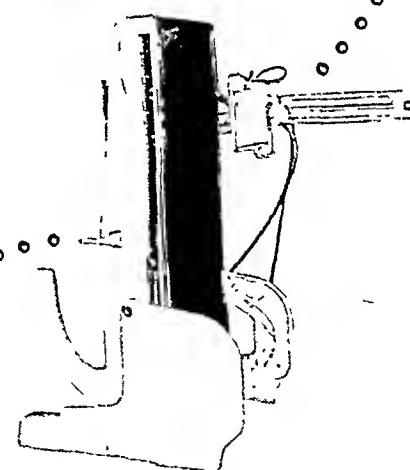
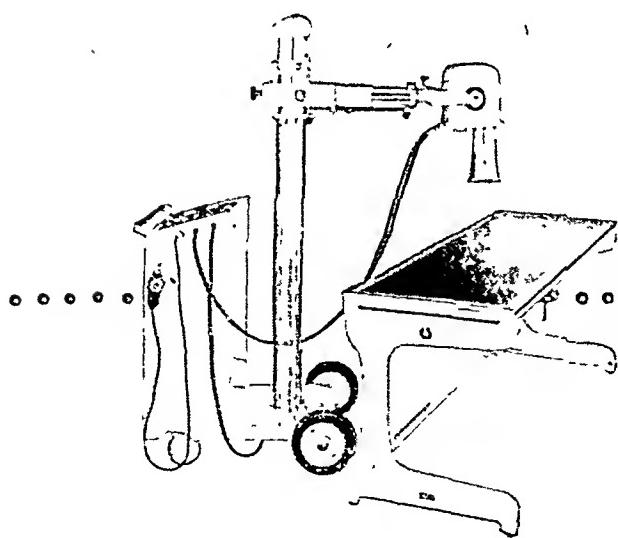
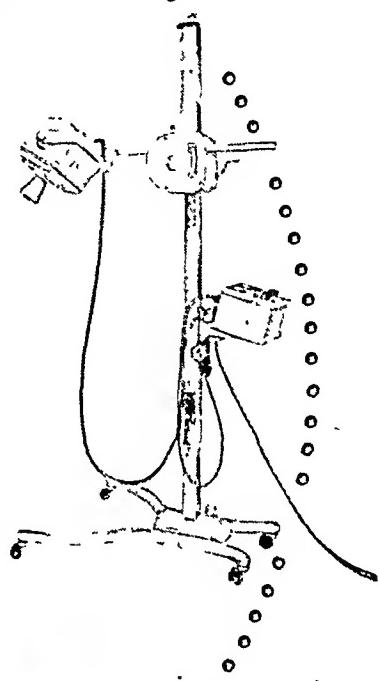
*Trade Mark



A KELEKET UNIT for *Every Diagnostic Requirement*

No matter what the size of your office, clinic or x-ray department; no matter what type of equipment you require, there is a KELEKET unit tried and proven to give you the finest possible results in your work—at a practical price.

Illustrated are only a few of the more popular Keleket models available through X-Ray and Radium Industries Limited.



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Widest Application of Oestrogen Therapy

Widespread clinical application of Dienoestrol B.D.H. has confirmed the fact that the dosage of this synthetic oestrogen need never be restricted to a point below the level of full therapeutic effectiveness. Indeed, toxic effects have never been reported to have followed its administration.

DIENOESTROL B.D.H.

Dienoestrol B.D.H. possesses all the advantages of both natural and synthetic oestrogens and none of the disadvantages. Moreover, it exhibits, at a fraction of the cost, the identical effects of the natural hormone. Dienoestrol B.D.H. is, therefore, the oestrogen of choice for general clinical use in all conditions in which oestrogenic substances are indicated.

Dienoestrol B.D.H. is issued in tablets of 0.1 mgm., 0.3 mgm., 1.0 mgm. and 5.0 mgm. in bottles of 100, 500 and 1,000 tablets.

Dienoestrol Compound Tablets B.D.H.—each tablet represents Dienoestrol B.D.H. 0.1 mgm. and Phenobarbitone $\frac{1}{4}$ gr.



**THE BRITISH DRUG HOUSES
(CANADA) LIMITED**

TORONTO

CANADA

ADEQUACY and ECONOMY IN DIETARY REINFORCEMENT

DIETARY SUPPLEMENT

B. D. H.

Practitioners recognize that the "cost factor" frequently restricts the administration of an extra-dietary source of special nutrients even in the presence of urgent need.

Dietary Supplement B.D.H. has been designed to supply necessary vitamins and minerals in adequate amounts at a cost which represents the greatest value for the "vitamin dollar".

When the daily diet for any variety of reasons fails to furnish the appropriate level of correct nutrients, the administration of Dietary Supplement B.D.H. will provide the most efficient, economical and convenient method of dietary reinforcement.

ONE CAPSULE AND ONE TABLET CONSTITUTE A SINGLE DOSE

VITAMINS IN CAPSULES - MINERALS IN TABLETS

each capsule contains

Vitamin A.....	1,500 int. units
Pro-vitamin A (Beta-carotene).....	1,500 int. units
Vitamin D.....	600 int. units
Thiamine Hydrochloride (Vitamin B ₁).....	1.2 mgm.
Riboflavin (Vitamin B ₂).....	1.0 mgm.
Nicotinamide.....	10.0 mgm.
Ascorbic Acid (Vitamin C).....	25.0 mgm.

each tablet contains

Ferrous Sulphate Exsiccated B.P.....	2.0 grains
Calcium Phosphate B.P.....	2.0 grains

To preserve the thiamine hydrochloride from the known destructive action of iron salts, Dietary Supplement B.D.H. is presented in two parts—the vitamins in capsules and the minerals in tablets.

ISSUED IN CARTONS CONTAINING ONE BOTTLE OF 100 CAPSULES AND ONE OF 100 TABLETS

THE BRITISH DRUG HOUSES
(CANADA LIMITED)

TORONTO

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Are babies too much like people?

Babies would be a lot less trouble if they'd automatically like all the things that are good for them.

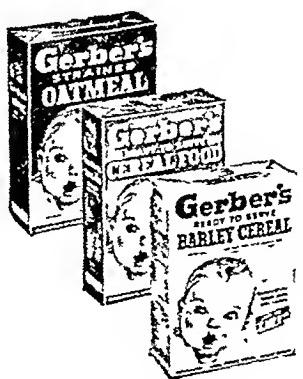
But they won't.

So Gerber's can't stop at making baby cereals that are merely "good for" babies. It isn't *nearly* enough that the high nutritional values of Gerber's Baby Foods please doctors.

We have to be specialists in making foods that babies like better too. In fact, one of the reasons Gerber's please so many mothers is that babies like them so well.

All 3 Gerber's Cereals have the "just-right" taste and texture that babies beam over! And all three are enriched with added iron, calcium, and vitamin B-complex. Pre-cooked, ready-to-serve. Just add formula or milk.

FREE SAMPLES of 3 Cereals — plus professional reference cards. Write to Gerber's, Dept. C110 S., McNair Products Company, Ltd., 779 Dufferin Street, Toronto 3, Ontario.

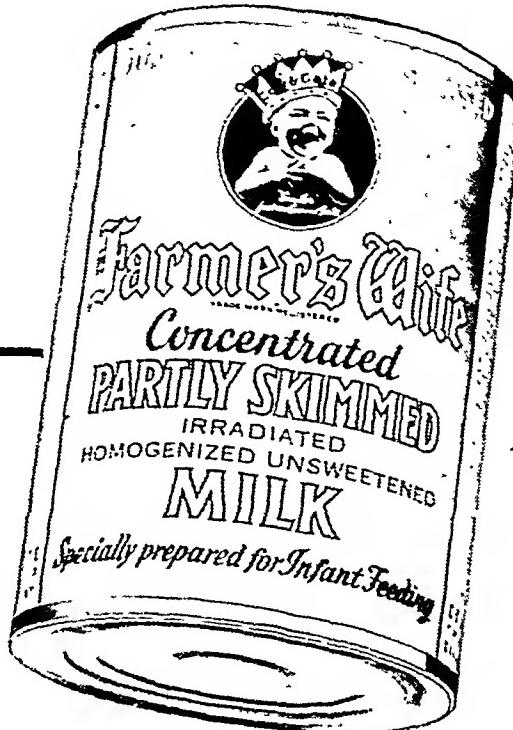


Gerber's
Baby C. ls

Cereal Food • Strained Oatmeal • Barley Cereal

WELCOMED

BY BABY'S DELICATE
DIGESTIVE ORGANS



"FARMER'S WIFE"

has proved its value in All infant feeding

SO many digestive disturbances in infants are traceable to too rich a milk. That's why so many paediatricians favour basing all feeding formulae on the use of a partly skimmed milk.

"Farmer's Wife" Milk is produced from the specially selected cow's milk of a Tuberculosis Accredited Free Area. It's homogenized, irradiated and sterilized. When diluted with an equal amount of water, it results in a half skimmed (2% fat) milk — which is easier for infants to digest. And it has a Vitamin D potency of 400 International Units per reconverted quart (half Farmer's Wife — half water).

*Please write for literature
and pocket formula card.*



COW & GATE (CANADA) LIMITED
GANANOQUE, ONTARIO

YOU GRIN AND BEAR IT WHEN...



*It's your wedding anniversary—7 P. M.
—and six patients still waiting*

...But some things you don't have to bear

Wouldn't you know it? Things like this always seem to happen to doctors ... and they take it good-humoredly in stride. But there are some personal annoyances you *don't* have to put up with. You don't have to let your concern about the welfare of others make you shrug off *your own* discomforts—such as annoying skin irritations.

After all, you and thousands of members of the Medical Profession recognize Noxzema's ability to soothe many of the common skin irritations *other* people complain about. Isn't it reasonable to treat yourself with the same common sense care you give your patients? Why grin and bear it... when Noxzema can save you so many uncomfortable moments?

1. Use medicated Noxzema for your face when it's irritated by exposure to bad weather. And use Noxzema for

shaving, as a base for regular lather, or as a brushless shave cream. It helps protect sensitive skin.

2. Use Noxzema for your hands when they're bothered by winter chapping or roughened and red from scrubbing. It's soothing—helps heal tiny cracks.

3. Use Noxzema for your feet when they're tired and burning after a hard day. It's greaseless, cooling, won't stain.

For Your Information

Regular Noxzema Skin Cream is a modernization of Carron Oil, fortified by adding Camphor, Menthol, Oil of Cloves and less than $\frac{1}{2}\%$ of Phenol in a greaseless, solidified emulsion. Its reaction is almost neutral—the pH value being 7.4.

Where an antipyretic and/or antipsoric is indicated, as in the case of painful skin irritations of various types—itching rashes and burns—mildly medicated greaseless Noxzema can be safely recommended and prescribed for your patients.

74%

SUCCESSFUL RESULTS in common urinary tract infections

*Mandelamine** therapy affords notably successful results in a high percentage of common urinary tract infections. Carroll and Allen, in their recent carefully analyzed study† of 200 unselected cases, obtained prompt and effective responses in 74 per cent of the patients.

*Mandelamine** therapy offers 6 advantages.

1. No gastric upset;
2. No fluid regulation;
3. No dietary restrictions;
4. No supplementary acidification (except when urea-splitting organisms are present);
5. Wide range of antibacterial action;
6. Simplicity of administration.

MANDELAMINE

Brand of Hexydaline
(Methenamine Mandelate)

SUPPLIED. Enteric-coated tablets of 0.25 Gm. (3½ grains) each, in bottles of 100, 500 and 1,000.

*The word MANDELAMINE is a registered trademark of Nepera Chemical Co., Inc.

†Carroll, G., and Allen, H. N.: The Treatment of Urinary Infections with Mandelamine (Methenamine Mandelate); A Clinical Study of 200 Cases. J. Urol. 55: 674-681 (June) 1946.



NEPERA CHEMICAL CO., INC.

MERCK & CO. Limited Sole Distributors MONTREAL





An Arm Immersion Test at the Procter & Gamble Skin Research Laboratory

On Guard - for greater protection of Baby's tender skin . . .

BECAUSE the skin, physiologically, is one of the most important organs of the human body, the soap that is used on it merits great scientific planning and testing.

And—when that soap is to be used on babies' tender skin (as Ivory is, millions of times a day)—it is especially important for every cake to be uniformly pure and mild.

That's why Procter & Gamble takes so many precautions to assure the purity and mildness of every cake of Ivory Soap.

For example, in the P & G Skin Research Laboratory continuous

studies are made of the human skin, particularly as it is affected by soaps and soap ingredients.

This research provides a scientific basis for selecting Ivory's ingredients and determining its manufacturing formula. Then, as Ivory is being made, it undergoes 216 separate control tests . . . to make sure, scientifically, that every cake of Ivory meets the high standards set by research findings.

* * *

Scientific research and manufacturing vigilance work hand in hand for greater protection of baby's skin. Ivory Soap is gentle . . . safe!



99 4/100% PURE
IT FLOATS
MADE IN CANADA

Ivory care is the most famous
skin care in the world

HOMOGENIZED FOR EASILY ADMINISTERED EARLY SUPPLEMENTATION



The modern trend in infant feeding favours supplementation of the milk diet—other than with orange juice and cod liver oil—at an early date. Because Libby's Baby Foods are *Homogenized* for easy digestion they lend themselves well to the technique of bottle-fed supplementation; they flow freely through a nipple opening of normal size; no other baby food is known to possess this property. Clinical experience has shown

that supplementation with Libby's is practical as early as the sixth week of life.

Trials	Time consumed (in seconds) by flow of 100 cc.			
	Whole Milk	Milk Mixed with LIBBY'S Homogenized Vegetables	Milk Mixed with Commercially Strained Vegetables	Milk Mixed with Home-Sieved Vegetables
<i>Through nipple with largest hole of a standard set of 3</i>				
1	144	146	No Flow	No Flow
2	143	150	No Flow	No Flow
3	148	146	No Flow	No Flow
Average	145	147	No Flow	No Flow
<i>Through nipple with smallest hole of a standard set of 3</i>				
1	211	250	No Flow	No Flow
2	210	256	No Flow	No Flow
3	211	256	No Flow	No Flow
Average	211	254	No Flow	No Flow
Average of 8 trials		241		

This table shows the time required (in seconds) by the flow of 100 c.c. of whole milk and mixtures of whole milk with 20 grams of carrots, spinach and peas (variously prepared) through two sizes of commonly used rubber nipples.

Squash
Spinach
Carrots
Peas
Peas, Carrots, Spinach
Beets

Vegetables with Beef and Barley
Vegetables with Bacon and Barley
Vegetable Soup
Liver Soup

Apple Sauce
Apples and Prunes
Apples and Apricots
Peaches
Custard Pudding

LIBBY'S ONLY
BABY FOODS
ARE HOMOGENIZED

Food Cell Before Homogenization

Food Cell After Homogenization

Libby, McNeill & Libby of Canada, Limited, Chatham, Ontario

LMP6-41

Eliminate infection in

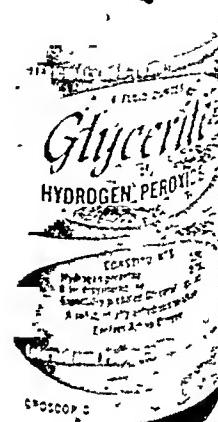
WOUNDS ULCERS
LESIONS FISSURES
ABSCESSSES CYSTS

by simple topical application

Glycerite of Hydrogen Peroxide *ipc*

stable, long-acting, non-selective,
bactericidal solution . . .

- . . . Possesses the mechanical advantages of liquid
and ointment types of medication . . .
- . . . Hygroscopic, penetrates into and
draws plasma from deeper parts of wounds,
washing particulate matter to the surface . . .
- . . . Aids granulation of healthy tissue and
speeds healing processes . . .
- . . . Non-toxic, non-irritating, non-sensitizing . . .
Apply full strength as frequently as desired.



GLYCERITE OF HYDROGEN PEROXIDE *ipc*

Bibliography:

- New Eng. J. Med. 234:468, 1946.
J. Invest. Derm. 8:11, 1947.
Annals of Allergy 4:33, 1946.
Science 105:312, 1947.
J. Bacteriology Vol. 53, June, 1947.

" Literature on request.

CONSTITUENTS:
Hydrogen peroxide (90%)
2.5%
8-Hydroxyquinoline 0.1%
Especially prepared glycerol
q.s. ad. 120cc.
Supplied in four-ounce
bottles

International PHARMACEUTICAL CORPORATION
132 Newbury Street, Boston 16, Massachusetts

for
the treatment of
HYPERACIDITY

*MAGDROX

ALKALINE SEDATIVE

COMPRESSED TABLETS

Each tablet contains:

Magnesium Trisilicate 5 grs.
Magnesium Hydroxide 4 grs.
Sodium Phenobarbital 1/8 gr.
Atropine Sulphate 1/2000 gr.

Directions: One or two tablets crushed or chewed and swallowed with water before meals or food taken at other times.

LIQUID

Each fluid ounce contains:

Magnesium Trisilicate 64 gr.
Magnesium Hydroxide 32 gr.
Sodium Phenobarbital 1 gr.
Atropine Sulphate 8/2000 gr.

Directions: One or two teaspoonfuls in water before meals or food taken at other times.

- Magnesium Trisilicate approaches closely the ideal antacid. It neutralizes the hydrochloric acid of the gastric juice by chemical action and possesses adsorptive properties but does not interfere with peptic digestion. Small amounts neutralize a large amount of acid. Being insoluble it does not leave the stomach quickly. It has only a slight stimulating action on the colon.
- Magnesium Hydroxide is very effective in neutralizing excessive acidity in the stomach. It does not produce carbon dioxide and will not provoke subsequent hyperacidity. In the intestine it has some laxative effect due to osmosis.
- Sodium Phenobarbital being a sedative to the nervous system is included to minimize the nervous element so prominent in some gastric conditions.
- Atropine Sulphate by some unknown mechanism decreases hyperactivity of the gastro-intestinal tract, thus it tends to relieve of the spasm. In addition, its inhibitory action on the parasympathetic endings, it cuts down secretions.

Indications:

Antacid in gastric hyperacidity and pain; gastritis and duodenal ulcer; acute and chronic gastritis; gastric neuroses.

* Trade Mark Registered



CHARLES R. WILHELM COMPANY LIMITED
1928-1948

Your patients get



kinds of relief with

this new and different analgesic

It has been repeatedly demonstrated that amelioration of mood is a prime objective in the management of painful conditions.

Edrisal presents a significant advance in the treatment of pain—in that it contains two recognized analgesics, phenacetin and acetylsalicylic acid, *plus* the logical and effective anti-depressant, Benzedrine Sulfate. An increasing number of reports from physicians state that their patients prefer Edrisal to other analgesic combinations.

Edrisal affords prompt relief in a wide range of painful conditions, such as:
Dysmenorrhea
Simple headache
Neuralgia
Grippe
Sinusitis
Muscle and joint discomfort
Phlebitis
Rheumatism and allied conditions

Edrisal *highly effective*

in the relief of pain

The Leeming Miles Co., Ltd.
Montreal
Canadian Distributors for
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Philadelphia



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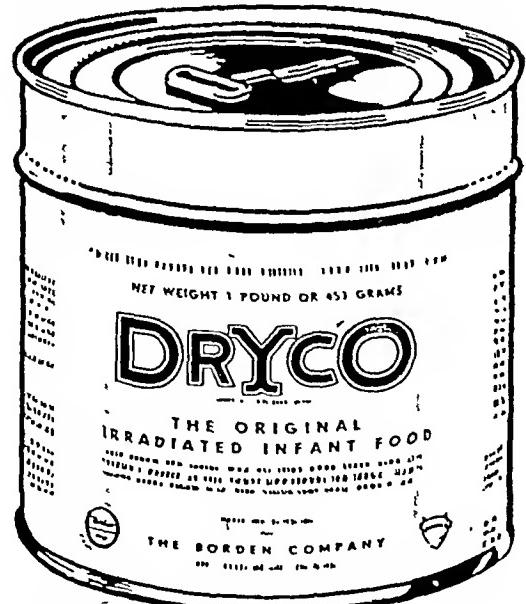
"Of course, I know a good high-protein, low-fat infant food!" exclaimed Elsie the Borden Cow

"It's my new improved Dryco — a flexible, scientifically adjusted milk food designed solely for infant nutrition.

"Dryco is made from spray-dried superior quality whole milk and skim milk with no non-milk substances except pro-vitamin A and vitamin D.

"Standard Dryco formulas supply 40% more protein and 50% less fat than standard milk formulas and ample potencies of vitamins A, B₁, B₂, and D and important minerals.

"Dryco is quickly soluble in cold or warm water. And it can be used alone, with carbohydrate, with milk, or with milk and carbohydrate. All druggists carry Dryco, or can obtain it."



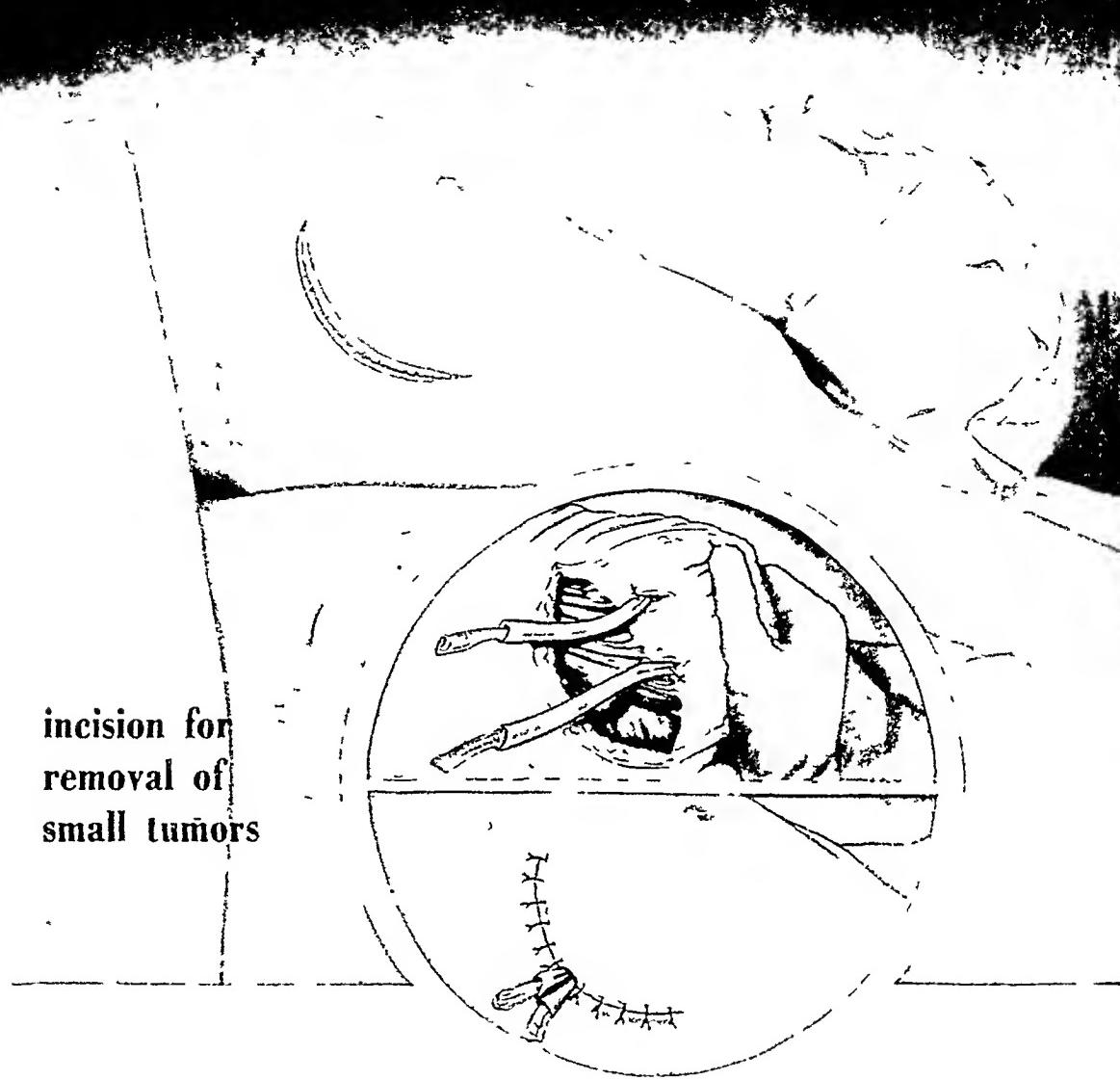
New Improved DRYCO — high-protein, low-fat infant food

Borden's Formula Foods

Mull-Soy—emulsified soy bean food • C.M.P. Powdered Protein Milk • C.M.P. Powdered Lactic Acid Milk
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incision for
removal of
small tumors

You're using more Ethicon Silk . . .

"A strand of silk prepared exclusively and especially for suture use will fill a long-felt need."

Ethicon Black Braided Silk, in filling this need, provides new uniformity of strength, most important quality of a silk suture.

In addition, Ethicon Silk is strong, proved by independent laboratory tests to average 20% stronger than ordinary surgical silk.

Ethicon Black Braided Silk also has these other characteristics which are of such

great importance to the surgeon

Handles easily; possesses optimum pliability, taking to the needle gracefully and drawing through tissue smoothly; gives maximum holding power with minimum amount of material; knots easily to exact tension desired, the knots remaining secure and free from slippage.

These are the reasons why Ethicon Black Braided Silk has been such a big success from the day of its introduction

Johnson & Johnson
Manufacturing Company



Photographs made under hospital supervision.

in CHRONIC POLIOMYELITIS

This male child, age 5 $\frac{1}{2}$, had acute poliomyelitis in August, 1943, which left him with a marked kyphotic element in a kypho-scoliosis and with involvement of right upper extremity. Kyphosis quite high; abdominal muscles weak. A Spencer Spinal Support was first applied October, 1945, to arrest deformity and support weakened muscles. Body carriage has steadily improved. Spinal fusion postponed indefinitely.

His latest Spencer, shown above, was designed on prescription to specified heights in back and front; with 1 rigid and 1 stiff steel each side of spine; with orthopedic shoulder straps; with a special Abdominal Spring Pad to give buoyancy to movement and help increase intra-abdominal pressure.

Each Spencer Support is *individually designed, cut and made* for each patient in non-elastic material guaranteed not to lose its shape. Yet it is *comfortable*—assuring patient cooperation.

For a dealer in Spencer Supports, look in telephone book under "Spencer corsetiere" or "Spencer Support Shop," or write direct to us.

May We Send You Booklet?

SPENCER SUPPORTS (CANADA) LIMITED
Rock Island, Quebec.

U.S.A.: Spencer, Incorporated, New Haven, Conn.
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Please send me booklet, "How Spencer Supports Aid The Doctor's Treatment".

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SPENCER INDIVIDUALLY DESIGNED SUPPORTS

For Abdomen, Back and Breasts

The Beckman Oxygen Analyzer

Easy to Operate

Shows Oxygen Concentration

**Directly on the Scale at
the Push of a Button**



- No chemicals to spill or stain
- No glass bulbs or tubes to break
- No syringes or stopcocks to freeze

Here's an oxygen analyzer so easy to operate that anyone can use it. No solutions are used . . . it operates magnetically. A timesaver. the Beckman analyzer makes an accepted routine of oxygen analysis, which is so necessary for effective oxygen therapy.

The sample is drawn into the analyzer by squeezing a bulb. At the touch of a button, a light beam appears on the scale to show the oxygen concentration.

Designed specifically for oxygen therapy use, the Beckman analyzer is light—weighing only $2\frac{1}{4}$ pounds—it is compact—measuring only 6 by 5 by $3\frac{1}{2}$ inches.

DOMINION OX

Sold by
THE DOMINION COMPANY, LIMITED

For more information,
ask your
Ox

In Eczema

or whenever coal tar therapy is indicated . . .

SUPERTAH (NASON'S) "has proven as valuable as the black coal tar preparations"

Swartz and Reilly, "Diagnosis and Treatment of Skin Diseases," p. 66

SUPERTAH is WHITE — not black — so hardly noticeable on the skin.

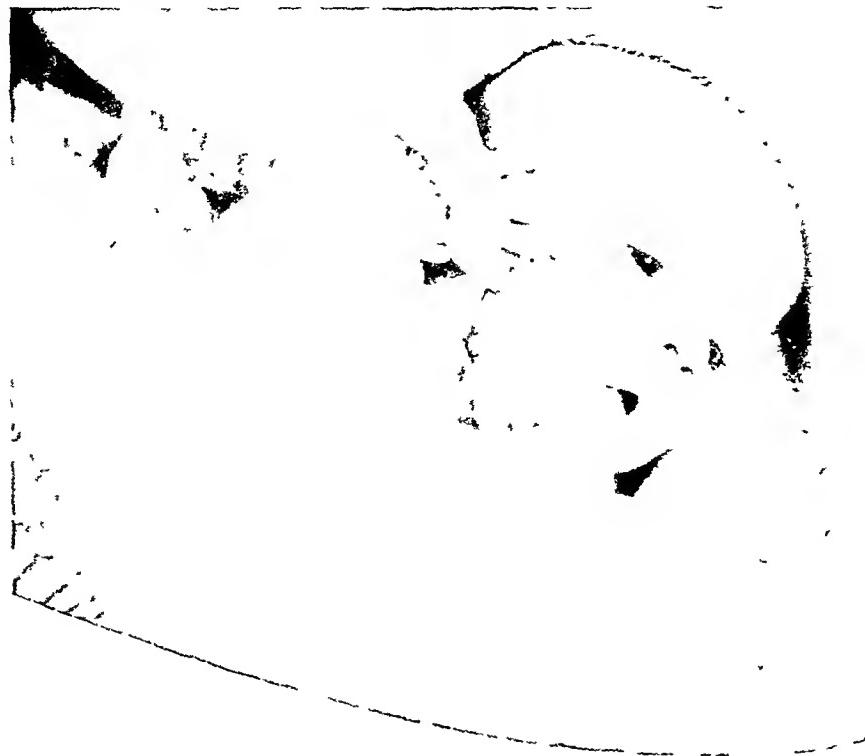
Easy to remove. Will not stain or discolor skin, bedding, clothing. No tarry odor.

Non-irritating and non-pustulant, can be left on indefinitely with no fear of dermatitis.

Patients use SUPERTAH willingly — freed from the objectionable features of black coal tar ointments.

SUPERTAH (NASON'S) is distributed ethically in 2 oz. jars
(in 5% or 10% strength)

TAILBY-NASON COMPANY, *Kendall Square Station*, BOSTON 42, MASS.



A good grip on life

With infant mortality at its highest during the first month of life, the fewer the burdens on the baby's endurance, the firmer will be his grip on life. And gastro-intestinal upset, colic and diarrhea can be heavy burdens for an infant.

'Dexin' has proved an excellent "first carbohydrate." Because of its high dextrin content, it (1) resists fermentation by the usual intestinal organisms; (2) tends to hold gas formation, distention and diarrhea to a minimum, and (3) promotes the formation of soft, flocculent, easily digested curds.

'Dexin' brand High Dextrin Carbohydrate is simply prepared in hot or cold milk and is readily adaptable to increasing formula needs. 'Dexin' does make a difference.

HIGH DEXTRIN CARBOHYDRATE
Dexin
BRAND

Composition—Dextrins 75% • Maltose 24% • Mineral Ash 0.25% • Moisture 0.15% • Available carbohydrate 94% • 115 calories per ounce • 6 level packed tablespoonfuls equal 1 ounce • Contains twelve ounces and three pounds



BURROUGHS WELLCOME & CO. (The Wellcome Foundation Ltd.) Montreal

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Contractional Generators

— Portable and Hospital Models

7½ meter Short Wave Diathermy Generators

— Portable and Hospital Models



All Sinemaster Products Unconditionally Guaranteed



CLINICAL DEVELOPMENT COMPANY

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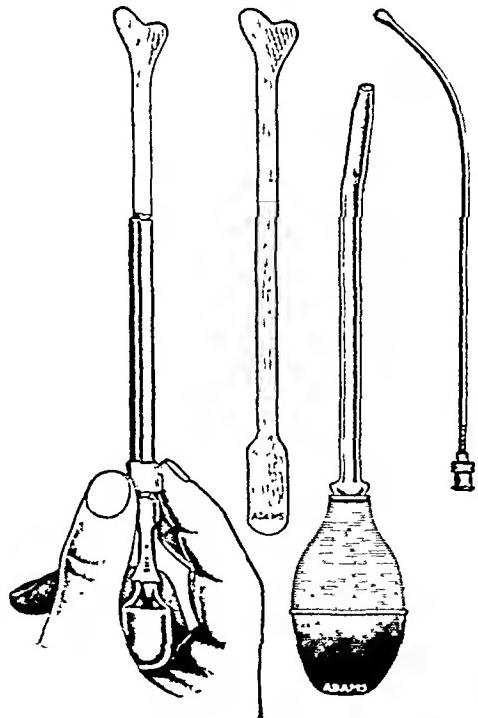
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TORONTO

Physician's Kits and Supplies for

PAPANICOLAOU-TRAUT & AYRE'S "SURFACE BIOPSY" CYTOLOGY METHODS

for the diagnosis of early uterine cancer



IMPORTANT: The taking of smears, scrapings, etc. in preparation for staining and diagnosis is a relatively simple matter and can be done by any trained physician or technician. The staining and diagnosis should be done only by those prepared by intensive training in the technic. Cytology interpretation is highly specialized and requires the experienced judgment of cytologists especially trained in the field.

SUPPLIES

- A-2260 Ayre's "Surface Biopsy" Scrapers* per M \$15.00
..... per C 2.00
A-2263 Vaginal Pipettes, without rubber bulb each .60
A-2264 Aspirators Bulbs for Vaginal Pipettes each .60
A-2265 Handle for Ayre's "Surface Biopsy" Scrapers ... each 5.00
A-2266 Cary Metal Uterine Cannula, malleable each 1.50
A-1460X "Rite-On" Slides, 3 x 1" gross 3.25
A-1625C Two-Slide Mailers with envelopes dozen .90
A-2261 Bottle OG 6 and EA 50 (two bottles) 6.00
A-2262 Bottle Harris Hematoxylin 1.25

* Pat. applied for

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- A-2257 Physicians' Uterine Cancer Cytology Outfit, consisting of: 4 dozen Ayre's "Surface Biopsy" Scrapers, 2 Vaginal Pipettes, 1 Aspirator Bulb, $\frac{1}{2}$ gross "Rite-On" Slides, 2 dozen Two-Slide Mailers with envelopes, including directions Each \$6.50

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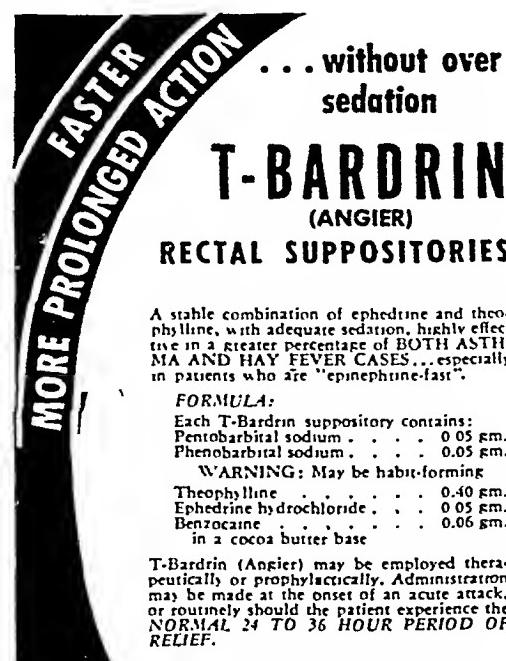
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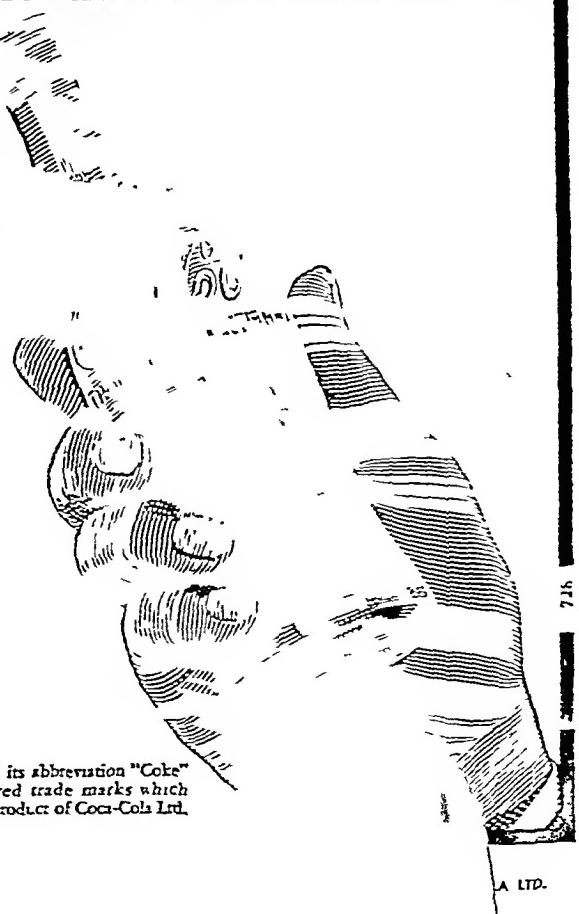
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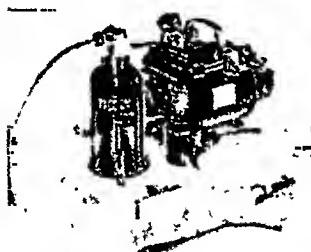
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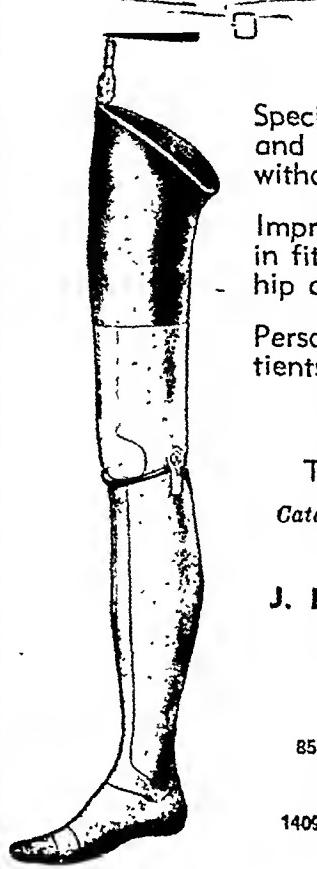
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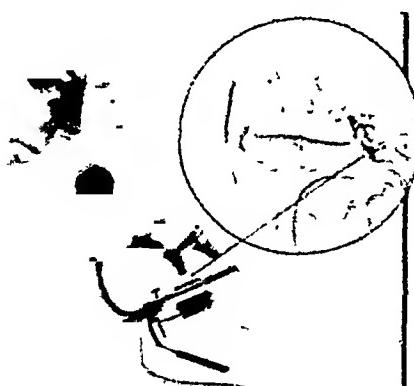
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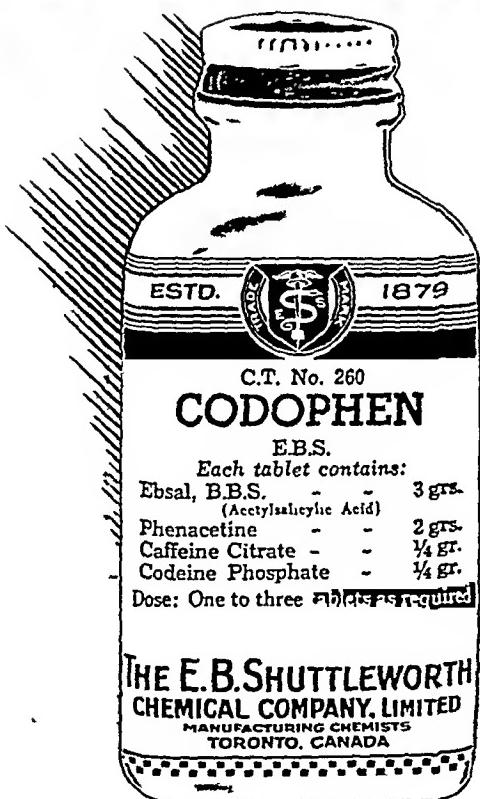
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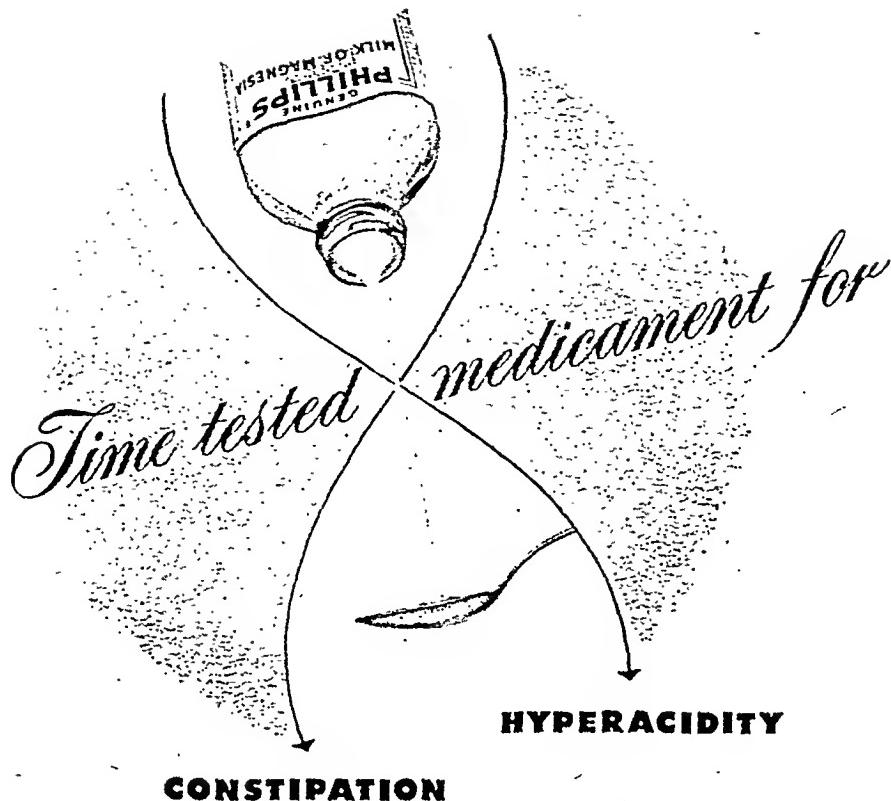


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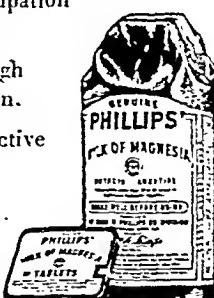


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